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July 1, 1968 - June 30, 1969



annual report

MASSACHUSETTS

DEPARTMENT

OF PUBLIC WORKS

EDWARD J. RIBBS
COMMISSIONER

ROBERT S. FOSTER

CHARLES A. BISBEE JR.

PETER E. DONADIO

JOHN P. KING

ASSOCIATE COMMISSIONERS

PUBLIC WORKS COMMISSION



The Commonwealth of Massachusetts

Department of Public Works

Office of the Commissioner

100. Nashua Street, Boston 02114

December 1, 1969

His Excellency, Governor Francis W. Sargent
and the Great and General Court of the
Commonwealth of Massachusetts

Gentlemen:

In accordance with Section 5 of Chapter 16, as amended by Chapter 821 of the Acts of 1963, I herewith submit the annual report of the Massachusetts Department of Public Works for the fiscal year ending June 30, 1969.

Once again the Department set new marks for the amount of construction under way, with more than \$226,000,000 in contracts in effect or pending on the final day of the fiscal year.

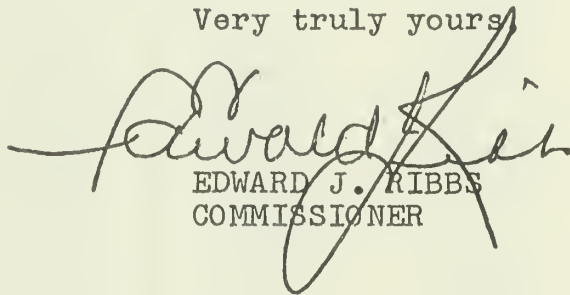
Naturally Interstate highway construction, reimbursable from federal funds up to 90 per cent of their cost, accounted for the bulk of the construction figure, but there was a notable increase in activity on primary, secondary and urban highways.

Whereas a year ago it appeared that the Joint Concept Study on the Boston Inner Belt might be long delayed,

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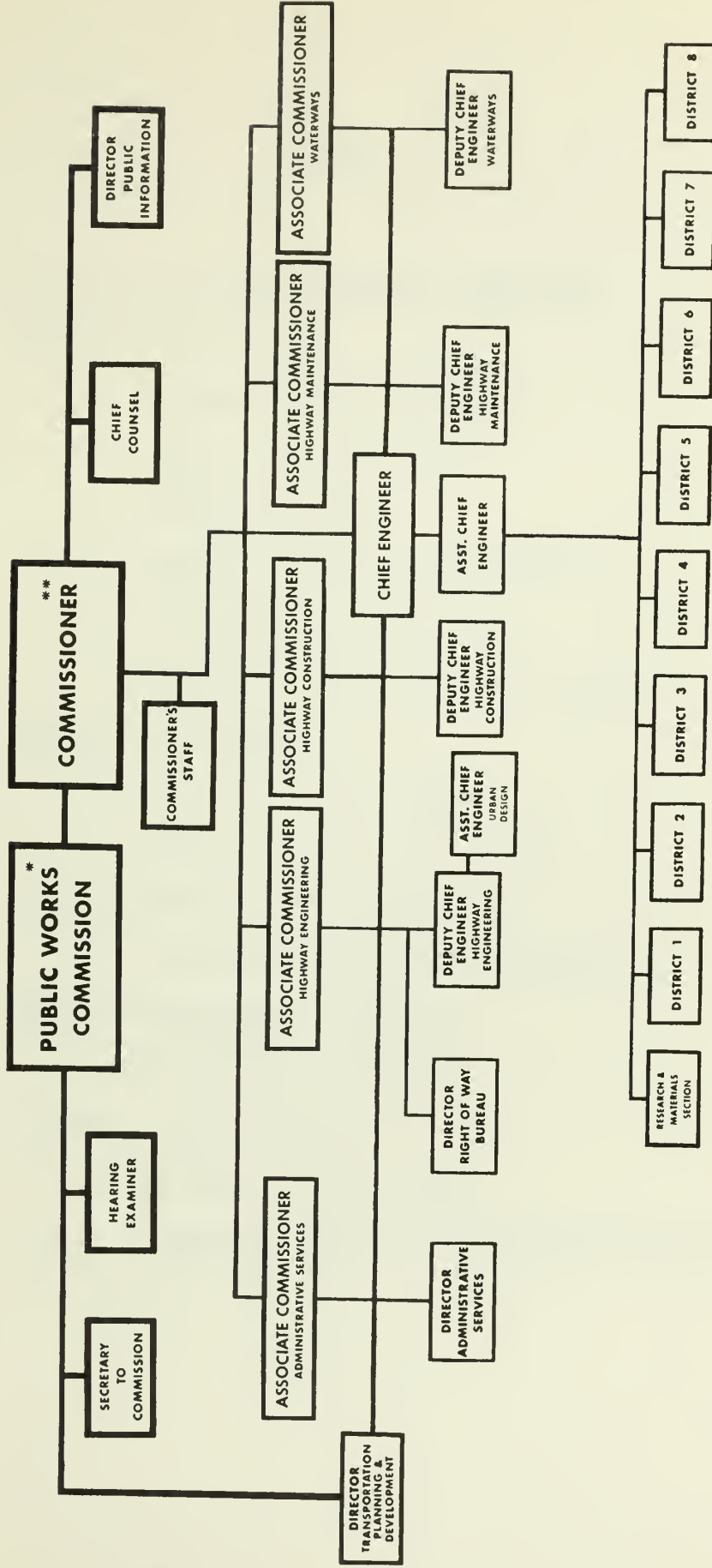
the Department has now reached agreements on the scope and direction of the Study with the four communities involved - Boston, Brookline, Cambridge and Somerville. It is expected that the Study can begin very early in calendar year 1970.

Very truly yours,

A handwritten signature in dark ink, appearing to read "Edward J. Ribbs", is written over the typed name and title. The signature is fluid and cursive, with a large loop at the end.

EDWARD J. RIBBS
COMMISSIONER

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS
ORGANIZATION CHART



* Commissioner & 4 Assoc. Commissioners
** Commissioner - Highway Engineering

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- A. Division of Administrative Services
- B. Highway Engineering
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- C. Highway Construction
 - 1. Construction Section
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- D. Highway Maintenance Section
 - 1. Maintenance Section
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 - 1. Division of Waterways
- F. Bureau of Transportation Planning and Development
- G. Legislation

A

DIVISION OF ADMINISTRATIVE SERVICES

The major functional activities of the Division of Administrative Services (approximately 324 employees) are as follows:

1. Processing, reviewing, recording and reporting all financial transactions of the Department.
2. Processing and recording of all personnel actions.
3. Coordinating the preparation and administration of the Department budget.
4. General Services.
5. Establishing and revising administrative procedures and systems.
6. Accident prevention and safety programs.
7. General secretarial activities.
8. Supervision of:
 - a. Public Works Building Security.
 - b. Public Works Building Operation and Maintenance.
 - c. Motor Pool Activities.

Appendix A presents organization chart and statement of responsibility for the Division and the sections thereof.

During Fiscal 1968, the Division continued its long-range effort to strengthen and streamline all functional operations, particularly in the general administrative and financial management areas. These efforts were hampered by personnel shortages due in large measure to difficulties in recruiting qualified personnel in critical areas. It is hoped that the pay raise passed late in the Fiscal Year will alleviate this situation somewhat next year.

APPENDIX A

Organization Chart

Statement of Responsibility

DIVISION OF ADMINISTRATIVE SERVICES

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS
STANDARD OPERATING PROCEDURES

S.O.P. No. ADM-01-35-1-000

PAGE 1 OF 1

SUBJECT DIVISION OF ADMINISTRATIVE SERVICES-ORGANIZATION
CHART

DISTRIBUTION
A

EFFECTIVE

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SUPERSEDES

PAGE 1 OF 1

APPROVED

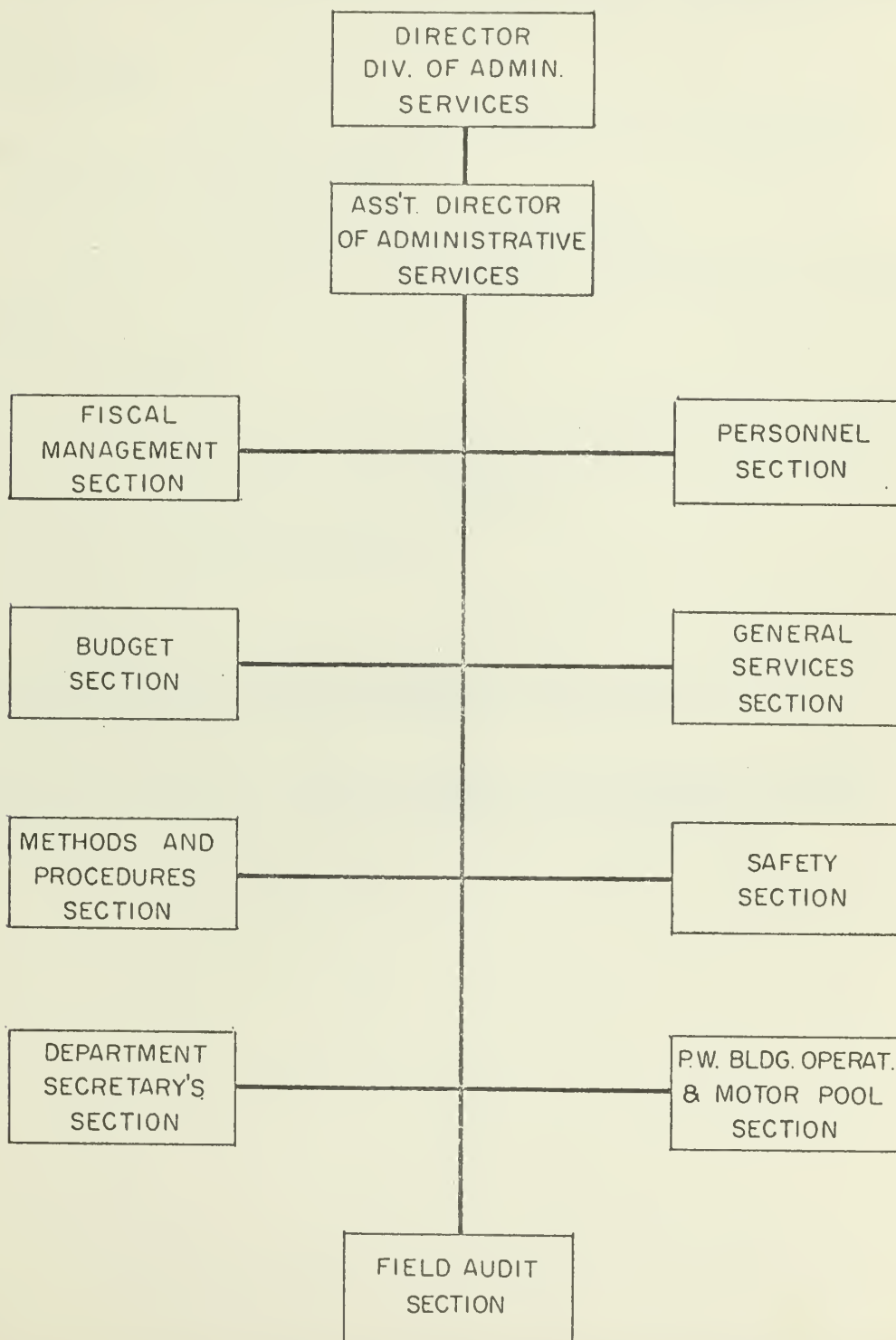
March 15, 1969

March 15, 1969

S.O.P. No. ADM-01-35-1-000

EFFECTIVE July 1, 1967

Edward J. Little



COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS STANDARD OPERATING PROCEDURES			S.O.P. No. ADM-01-36-1-000	
			PAGE 1 OF 1	
SUBJECT DIVISION OF ADMINISTRATIVE SERVICES- STATEMENT OF RESPONSIBILITIES			DISTRIBUTION A	
EFFECTIVE	ISSUED	SUPERSEDES	PAGE 1 OF 1	APPROVED
March 15, 1969	March 15, 1969	S.O.P. No. ADM-01-36-1-000 EFFECTIVE July 1, 1967		<i>Edward J. Libb</i>

SUMMARY STATEMENT OF RESPONSIBILITIES

Responsible for the administrative and financial activities of the Department.

MAJOR ACTIVITIES

1. Processing, reviewing, recording and reporting all financial transactions of the Department.
2. Processing and recording all personnel actions.
3. Coordinating the preparation and administration of the Department budget.
4. General Services.
5. Establishing and revising administrative procedures and systems.
6. Accident prevention and safety programs.
7. General secretarial activities.
8. Supervision of:
 - a. Public Works Building Security
 - b. Public Works Building Operation and Maintenance
 - c. Motor Pool Activities.
9. Auditing of utility company, railroad and consultant contract billings to ascertain their correctness and propriety.

B

HIGHWAY DESIGN DIVISION

SURVEYS, PLANS, ESTIMATES & FINAL SURVEYS

During the fiscal year ending June 30, 1969,
preliminary surveys, plans, estimates and final surveys were
made as follows:

FOR STATE HIGHWAY CONSTRUCTION

	<u>Cities</u>	<u>Towns</u>	<u>Miles</u>
Preliminary Surveys	8	21	62.4
" Plans	0	15	15.5
" Estimates	13	18	33.0
Final Surveys	10	6	37.2

FOR STATE HIGHWAY RECONSTRUCTION

Preliminary Surveys	8	16	35.5
" Plans	7	25	21.5
" Estimates	6	16	13.7
Final Surveys	3	2	5.3

FOR CHAPTER 81

Preliminary Surveys	0	4	1.2
" Plans	0	1	0.2
" Estimates	0	169	9131.3
Final Surveys	0	0	0

FOR CHAPTER 90
(Advertised & Unit Price)

Preliminary Surveys	12	37	46.7
" Plans	12	32	43.3
" Estimates	14	28	35.5
Final Surveys	2	13	9.4

HIGHWAY DESIGN DIVISION

FOR CHAPTER 90 CONSTRUCTION
(Force Account)

	<u>Cities</u>	<u>Towns</u>	<u>Miles</u>
Preliminary Surveys	1	76	57.5
" Plans	3	92	57.5
" Estimates	5	182	206.5
Final Surveys	0	3	3.7

FOR CHAPTER 90 MAINTENANCE

Preliminary Surveys	0	0	0
" Plans	0	0	0
" Estimates	0	211	806.7
Final Surveys	0	0	0

FOR ROADSIDE DEVELOPMENT

Preliminary Surveys	0	0	0
" Plans	2	2	8.2
" Estimates	5	17	52.5
Final Surveys	0	3	0.3

FOR ACCIDENT PRONE

Preliminary Surveys	7	20	13.3
" Plans	6	17	8.8
" Estimates	9	36	68.0
Final Surveys	0	5	4.3

FOR RECONSTRUCTION SUB-STANDARD BRIDGES

Preliminary Surveys	2	11	3.4
" Plans	3	9	2.6
" Estimates	1	6	0.8
Final Surveys	0	0	0

Note:

No Landscape & Scenic Enhancement Projects
No Control of Junk Yards Projects

HIGHWAY DESIGN DIVISION

GEODETIC SURVEYS

FIELD WORK

TRIANGULATION	40 Sq. Miles
TRIANGULATION RECONNAISSANCE	40 Sq. Miles
SECOND ORDER TRAVERSES	106 Miles
LEVEL LINES	15 Miles
GEODETIC MONUMENTS RECOVERED	700
NEW GEODETIC MONUMENTS ESTABLISHED	120
GEODIMETER MEASUREMENTS FOR DISTRICTS	300 Miles

OFFICE COMPUTATIONS

TRIANGULATION NETS COMPUTED	40 Sq. Miles
SECOND ORDER TRAVERSES COMPUTED	60 Miles
BASELINE TRAVERSES COMPUTED	210 Miles
LEVEL LINES COMPUTED	15 Miles
TOWN CORNERS COMPUTED	3,060
FILE CARDS RE-TYPED AND DRAFTED	1,250

MISCELLANEOUS

OBTAINING GEODETIC DATA FOR STATE AND PRIVATE AGENCIES
 DRAFTING PLANS OF GEODETIC AND BASELINE TRAVERSES
 FORTRAN PROGRAMS FOR GEODETIC SURVEY

AREIAL SURVEYS

A. RECONNAISSANCE (Scale 1"=200')	140.29 Sq. Miles
B. PRELIMINARY PLANS, PROFILES, CROSS SECTION & CONSTRUCTION TRACING (Scale 1"=40')	43.00 Miles
C. AERIAL PHOTOGRAPHY SCALE 1"=600'	3670 Sq. Miles

HIGHWAY DESIGN DIVISION

LAYOUT SECTION

10.954 additional miles of State Highway were laid out in 2 Cities and 10 Towns.

38 State Highway alterations not involving additional mileage were made in 13 Cities and 20 Towns.

1 Section of State Highway was discontinued in 1 Town for a total of 0.218 miles.

1 City layout in 1 City was Prepared

1 Town layout in 1 Town was Prepared.

92 Advance takings in 8 Cities and 7 Towns were prepared for proposed State highway locations, 55 being taken in the City of Boston.

The total length of State highway location on July 1, 1969 was 2635.175 miles.

HIGHWAY DESIGN DIVISION

During the period July 1, 1968 to June 30, 1969, the Boston Metropolitan Area Design Section had under contract final design projects for approximately 13.8 miles of Interstate Highways, broken down as follows:

Route I-95 - 10.4 miles	Canton (Rte. 28) - Boston (Mass. Avenue)
Route I-93 - 1.9 miles	Medford-Somerville-Boston (Route I-695)
Route I-695 - 0.7 miles	Boston (Fenway Tunnel)
Route I-695 - 0.8 miles	Boston (City Sq.)
Somerville (Joy Street)	

Completed during this period were the plans for a \$12,467,000 viaduct section of Route I-695, 0.095 miles in Somerville plus Route I-93 connectors.

Completed during this period was a basic design study for 3.0 miles of Route 2 from the Concord Circle, Cambridge to Route I-695 in Somerville.

There was no design work done on Route I-695 from Brookline Avenue, Boston to Joy Street in Somerville pending findings of the Joint Concept Study.

RIGHT OF WAY BUREAU

In fiscal 1969 the Right of Way Bureau's mission continued to expand and to undergo major changes reflecting increasing public concern for the impact of highways upon individuals, businesses and neighborhoods.

10.9 additional miles of State highway were laid out in 2 cities and 10 towns. 39 State highway alterations not involving additional mileage were made in 13 cities and 20 towns. .21 miles of State highway was discontinued. 92 advance takings were made in 8 cities and 7 towns. Total length of State highway location on July 1, 1969 was 2635.175 miles.

To accomplish this end, 1827 parcels of land were acquired (an increase of 20.7% from fiscal 1968) for an initial acquisition cost of \$14,325,104 (an increase of 4% over 1968).

907 staff and 334 fee appraisals were completed. The appraisal review section reviewed 1,479 cases (an increase of 34.4% over 1968). The Real Estate Review Board rendered findings on 159 cases (26% under 1969).

The settlement of land damage cases showed a sharp increase during the fiscal year. The negotiation section made 993 offers (an increase of 14% over 1968). The Department settled 409 cases (an increase of 7.4% over the previous year). Attorney General settlements rose 11.1% as 219 cases were resolved at a total cost of \$5,169,787 (30% over fiscal 1968).

A review of all cases handled since October 22, 1964 under the provisions of the "60-day payment statute" reveals some

RIGHT OF WAY BUREAU

interesting experience figures on settlement. 44% of all cases were settled with owners at once. Of those who do not execute final settlements but accept pro tanto payments, fewer than 50% ever litigate within the two-year period of the statute of limitations. It appears, therefore, that 67% of all land damage cases are settled at the Department's figure without litigation. Of the remaining 33% approximately 80% are administratively settled by the Attorney General and only about 20% actually go to trial.

An important part of the success of the 60-day payment program lies in the ability to process payments rapidly. This process is at best a cumbersome one, involving a myriad of steps both within and without the Department. During fiscal 1969, 1088 payments for land damage were processed (an increase of 26.1% over 1968). An additional 43 payments were made on older backlog cases.

The Conveyancing Section reviewed 1085 title abstracts (an increase of 45.2% over fiscal 1968).

Increasingly important to the acquisition program has been the advance acquisition concept, in which properties are acquired out of phase to alleviate hardship upon individual owners or to forestall proposed development of proposed right of way which would either affect design or skyrocket acquisition costs. During 1968, the Congress, recognizing the urgency and common sense of the advance acquisition theory, established in the 1968 Federal Highway Act a \$100,000,000 advance acquisition

RIGHT OF WAY BUREAU

revolving fund to make interest free funds available to the States for program enhancement. Full administrative implementation of this revolving fund has not yet occurred but it is expected to be operative during fiscal 1970 if appropriate procedure can be developed both on Federal and State levels.

The advance Acquisition Section of the Right of Way Bureau during fiscal 1969 processed the acquisition of twenty residential properties located in ten communities to alleviate severe hardship. It also investigated an additional 100 cases which for one reason or another did not qualify for advance acquisition.

In the area of forestalling proposed development which would otherwise result in extremely high land taking costs, the Advance Acquisition Section acquired four parcels of land resulting in an estimated saving of \$2,650,000 future damages.

In a continuing effort to improve right of way operation, the training officer reports that 15 persons from the Bureau attended M. A. I. Course #1 given by the American Institute of Appraisers at Worcester Polytechnical Institute, 8 attended Course #2 sponsored by the Massachusetts Assessors School at the University of Massachusetts, and 30 attended the Marshall & Stevens Instructional Course at Boston. In addition, appraisal course workshop and negotiation instruction courses were held at the Arlington District Office.

1969 saw full implementation of the Property Management provisions of Chapter 427 of the Acts of 1966, a Department

RIGHT OF WAY BUREAU

sponsored bill which aimed at achieving basic management for property acquired for highway use. During the fiscal year, rentals under this program grossed \$135,178.96 with a net income after expenses of \$62,558.73. Sales of principal structures and improvements yielded \$53,328.16 and sales of land brought \$300,060.00. Parking area leases produced \$51,162.00. Additional leases netted \$209,464.68, bringing total net receipts to \$676,573.57 for fiscal 1969.

During the year, 572 structures were acquired, of which 408 residential and 162 were commercial (a total increase of 47% over 1968 with an increase of 43.1% in residential and 58.8% in commercial buildings).

During the same year, 435 structures were vacated (an increase of 168.5% over fiscal 1968) and 466 structures were released for demolition (an increase of 210.7%).

In dealings with the Bureau of Public Roads, the BPR liaison and Compliance Section of the Right of Way Bureau was extremely active. During the fiscal year \$1,189,180.87 of claims under Meredith & Grew Contract No. 9107 were resolved in favor of the Department. At the same time \$25,638.07 reclaim was submitted to the Bureau under the Audit Deduction Program and a major effort was put in motion on the processing of an additional \$1,034,260.18 of deductions which remain to be reclaimed when such action is completed. Finally during fiscal 1969, \$908,500.00 of ineligibility findings were resolved by the BPR Liaison and Compliance Section. In addition, many meetings with Bureau

RIGHT OF WAY BUREAU

of Public Roads Officials were held throughout the year in a variety of other administrative problems.

By far the most sweeping changes in Right of Way work were encountered in the fields of relocation payments and relocation assistance.

During the fiscal year 1969, land takings affected 492 families (an increase of 58.8% over 1968). During the same period 879 families were relocated (an increase of 282.5% over 1968). Takings affected 202 businesses (an increase of 72.6%) and 116 businesses were relocated (an increase of 93.9%). 1009 relocation payments were made (an increase of 250% over 1968) and the total amount of relocation payments were \$814,430.00 (an increase of 573.5%). In fact the dollar amount of relocation payments for fiscal 1969 almost equals the cumulative amount paid for the last five years.

But volume alone was not the major feature of this year's relocation story. On August 25, 1968 President Johnson signed into law the 1968 Federal Highway Act, and an entirely new era began for highway relocation. A whole new panorama of relocation benefits has been offered, including such claims as total moving costs, dislocation allowances, replacement housing bonuses, rent supplement payments, liquidation payments and incidental expense payments. This new legislative evidence of Congressional concern for those whose property is taken for public purpose is so sweeping that its program costs are expected to reach record

RIGHT OF WAY BUREAU

heights. This Bureau has already been made aware of several pending industrial claims which will exceed a quarter of a million dollars apiece. Administrative adjustments to run a program of this magnitude are urgent at this time. It is estimated that a significant increase in personnel will be mandatory if proper administration is to be achieved.

Not only are the relocation payments widely increased, but also the very scope and nature of relocation assistance. Following Massachusetts' lead, Congress has made the socio-economic preliminary relocation survey and the development of full relocation planning a mandatory national requirement, in response to the growing concern about sagging national housing problem. Key importance is placed upon relocating people into housing which is decent, safe and sanitary according to agreed standards. As much of the urban highway program runs through blighted areas, the problems are highlighted.

Full implementation of this sweeping program is expected during the next fiscal year. A failure to achieve that implementation will result in the suspension of Federal participation and approval of the highway program.

Under Contract 12585 with the Boston Redevelopment Authority, the Right of Way Bureau continues to pioneer in the development of more comprehensive utilization of total community and neighborhood resources to improve relocation procedures.

RIGHT OF WAY BUREAU

Contract 12718 with the City of Fall River likewise continues to be a major source of program improvement. Relocation assistance costs for services under these two contracts amounted to \$285,365.00 bringing the total amount of expenditures for relocation for fiscal 1969 in excess of \$1,000,000.

It is extremely important to note that the records of this fiscal year were accomplished without a single eviction.

The next fiscal year will severely challenge the Right of Way Bureau on all fronts, particularly in the fields of relocation, advance acquisition, property management and in the development of a new type of right of way plans urgently demanded by the Bureau of Public Roads. It is conservatively estimated that these developments will add 35% more work to the Bureau's total current work load. A major expansion of Bureau staff is urgently needed.

BRIDGE SECTION

During the period from July 1, 1968 to June 30, 1969, the Department advertised for bids for construction forty-nine (49) bridges and culverts, thirteen (13) retaining walls and one (1) repairs to an existing structure. These structures were either designed by or processed through the Department's Bridge Section.

These structures are located in twenty-three (23) cities and towns throughout the Commonwealth and cost approximately \$22,000,000.

Out of the total number of structures advertised, twenty-three (23) are for the Interstate Routes. These include eleven (11) for Interstate Route 91 in Springfield, ten (10) for Interstate 291 in Springfield and two (2) for Interstate Route 95 in Danvers.

The remaining structures are located on Route 2 in Gardner, Phillipston, Templeton; Route 52 in Oxford, Webster; Route 140 in Lakeville and various Federal Aid Secondary and Chapter 90 projects.

Twenty-one (21) boring contracts were advertised during this period at a cost of approximately \$200,000.

The Department has made preliminary studies and has initiated work on bridges at the following locations:

Route 25 in Bridgewater, Mansfield, Norton, Raynham and Taunton

Interstate Route 391 in Chicopee-Holyoke

Route 2 in Acton, Concord, Lincoln and Lexington

Interstate Route 95 widening from Danvers to New Hampshire Line

DeFranzo Circle in Saugus

BRIDGE SECTION

The Department has assigned structural steel fabrication inspection to two testing agencies amounting to approximately 34,000 tons. Other affiliated work includes the inspection of steel fabrication plants and steel mills, both in this country and Canada. In addition to the above a specification for ultrasonic testing of full penetration tee and corner welds was developed to keep abreast of current technology.

Requests from Utility Companies to place utilities on existing structures and requests for thirteen permits to overload certain structures were acted upon. This involved analyzing many structures to determine the stresses in the structures resulting from the additional loads. On one request, the Department had to analyze fifty six (56) structures.

The Department has completed standards for overhead directional signs. The Department has also been involved with the design, checking design of, and checking shop drawings for various Traffic Sign Contracts. The Traffic Signs that were checked in this Section cost over \$1,700,000.

The Department, at the request of municipalities involved has inspected and made recommendations on existing structures in the following locations: Weymouth, Falmouth, Rochester, Mansfield (3), Rehoboth, Canton, Saugus and Marshfield-Scituate. State bridges were inspected in Wareham, Hingham, Boston (2), Revere, Wrentham, Concord, Lee, Lancaster and Beverly.

Reviews were also made, as required under Chapter 85 of the General Laws, of bridge design in Framingham and Rehoboth.

TRAFFIC ENGINEERING SECTION

The Traffic Engineering Section underwent an internal reorganization during the fiscal year and is now comprised of the following Units:

1. Administration and Clerical
2. Traffic Operations and Safety
 - a. Accident Analysis and Records
 - b. Speed Zoning
 - c. Regulations
 - d. Safety Improvements
3. Signs and Pavement Markings
4. Traffic Signals and Highway Lighting

The Traffic Engineering Section has been actively involved in the Accelerated Highway Program on all levels including Interstate, State and Municipal roadways.

The following individual Unit reports reflect the quantity and type of work done throughout the fiscal year:

Chapters 519, 616 and 862, Acts of 1967, were administered by the Section along with review and design in the areas of geometrics, signing, pavement marking, traffic safety devices, highway lighting, speed zoning, traffic control agreements and accident study and research.

TRAFFIC ENGINEERING SECTION

Traffic Engineering (cont'd)

During the fiscal year the Section has supervised the Department's program of updating traffic control devices in order to achieve conformance with the National Joint Manual on Uniform Traffic Control Devices for Streets and Highways.

The Section has also been continually reviewing and updating the Massachusetts Manual on Uniform Traffic Control Devices and disseminating this information throughout the Commonwealth in an effort to bring all municipalities into conformance.

Progress reports concerning Chapters 519 and 862, Acts of 1967 are included in the enclosed Unit reports.

Chapter 616, Section 6, Acts of 1967, a bill providing 100% reimbursement to cities and towns for the installation of standard school zones as approved by the Department, was continued this fiscal year.

The following tabulation indicates the progress attained:

Permits		<u>Advertised</u>	<u>Awarded</u>	Memo of <u>Agreement</u>	Total Encumbrance <u>to date</u>
<u>Issued</u>	<u>- Processed</u>				
70	35	34	29	15	\$100,446

During this fiscal year the Traffic Engineering Section was relieved of the administrative responsibility regarding the Topics Program. The Section is still very actively involved in the design, review and assistance portions of this program.

TRAFFIC ENGINEERING SECTIONTraffic Engineering (cont'd)

In addition to activities related to new highway construction, the Traffic Engineering Section has expended considerable effort in the correction of accident-prone locations on existing highways by redesign and other means of traffic control.

The Traffic Engineering Section has continued its initiation of projects in the Safety Spot Improvement Program based on preliminary recommendations from the various Districts. Pertinent traffic data, including accident history records, traffic volume counts, engineering judgement and preliminary estimates of cost, were correlated to provide the justification for the improvement and the assignment of priority. This data provides a basis for further evaluation and actual programming for construction. This basic data is also necessary to satisfy the requirements of the Bureau of Public Roads for Federal participation in 50% reimbursement of ABC funds expended. The Traffic Engineering Section has proposed projects for corrective safety measures through 1970.

In order to accomplish all of this work the Clerical Unit processed approximately 4500 letters and 3000 permits and regulations.

During the fiscal year the Traffic Engineering Section continued the Monthly Traffic Engineering Meetings which involved all of the Districts and the Boston Office. These meetings have

TRAFFIC ENGINEERING SECTION

Traffic Engineering (cont'd)

been extremely helpful in maintaining two way communication and liaison between the Traffic Engineers in the Boston and District Offices.

The previous year's schedule is as follows:

July 17, 1968	Traffic Regulations
	Reflective Sheeting for
	Signing
August 22, 1968	Workshop on three previous
	lectures
	Speed Zoning and Use of
	Advisory Speed Plates
	"Entwhistle Safety Barrier"
September 18, 1968	Current Department
	Sign Policy
	Breakaway Sign Posts
October 23, 1968	Snow Emergency Compact
	Traffic Legislation - 1968
November 13, 1968	Capacity Manual

TRAFFIC ENGINEERING SECTION

Traffic Engineering (cont'd)

December 18, 1968	Workshop on three previous lectures
January 15, 1969	Pavement Markings
February 19, 1969	Speed Zoning and Advisory Speed Plates
March 19, 1969	District Responsibilities regarding Signing Construction projects
April 16, 1969	Workshop on three previous lectures Chapter 519, Acts of 1967 Chapter 616, Section 6 Acts of 1967
May 21, 1969	Traffic Counting Program
June 16, 1969	Conducted Tour of Wellesley Shops Signs, Pavement Markings, Signals

TRAFFIC ENGINEERING SECTION

ACCIDENT ANALYSIS

The Registry of Motor Vehicles has made substantial progress in the development of a statewide accident records capability in its Traffic Records project grant under the National Highway Safety Act of 1966, and delivery of effective accident source data to the Department will be accomplished at some time late into fiscal 1970.

The Traffic Engineering Section has rendered considerable assistance to the Registry in the creation of a workable system for the accurate determination of State Highway accident locations to within 100 feet on grid-coordinate reference maps.

Included in the project is a contract for computer software services to the Department for electronic data processing of the Registry source data to identify those specific locations on State Highways which have high or potentially high accident experience. The periodic and rapid compilation of accident data and subsequent analysis is the basis for establishing priority for improvements, selective enforcement or other operational practices involving safety in design, construction, traffic surveillance and maintenance which in total, influence the eventual elimination or the substantial reduction of hazards at the problem locations.

TRAFFIC ENGINEERING SECTIONAccident Analysis (cont'd)

During fiscal 1970, by cooperative efforts by the Department and the Registry of Motor Vehicles, the first accident records map system will be completed and used for precise coding and electronic processing of State highway accident location data. The coding of accident location will complete the data package and enable programming to be fully tested on the Department's newly installed IBM 360/40 engineering computer.

The Traffic Engineering Section also has been active in other areas covered by the National Highway Safety Act of 1966 as specified in the official standards covering fatal accident investigation, study and research; skid control, traffic surveillance, safety spot improvement programs, safety design standards and policy, speed zoning, and training programs to assist local communities in meeting safety requirements under the Act.

Accident investigation and data accumulation are functionally necessary as back up material for engineering and construction projects. These projects include safety programs both state and federally aided, traffic signal control and the redesign of traffic control signs, installation of guard rail, special safety lighting, the redesign of intersections and median storage lanes, the closing of dangerous crossovers and similar spot improvements.

TRAFFIC ENGINEERING SECTIONAccident Analysis (cont'd)

In conjunction with these programs, special studies have been made on accident-prone locations with accident record charts and illustrated collision diagrams as visual aids in connection with the Safety Improvement Program.

Fatal accidents continued to be of major concern and were checked daily to determine the pertinent facts relating to the accident. District personnel were alerted by phone to gather additional available data. Standardized fatal accident forms are currently in use by all Districts and all branch stations of the Registry of Motor Vehicles and State Police.

Two special studies were begun during fiscal 1969. One is to determine the effectiveness of the latest median guard rail barrier. The other study is an attempt to correlate proper speed zoning and its effect upon accident rates.

A weekly analysis was made of fatal accident data sheets to determine: (1) whether a geometric fault or design factor was involved, (2) if the accident could have been prevented, (3) could the severity of the accident have been lessened, and (4) could the fatality have been prevented.

During this fiscal period the Department participated in the B. U. Law-Medicine Institute Multi-Disciplinary Research Project (No. 2), a pilot study of motor vehicle accidents producing driver

TRAFFIC ENGINEERING SECTIONAccident Analysis (cont'd)

or passenger fatality involving single motor car in collision with fixed (or relatively fixed) object. Thirty-one fatal accidents were investigated by the Traffic Engineering Section. Upon notification from the office of the B. U. Project Director, a traffic engineering and road study was conducted by the Department under supervision of a four-man staff from the Traffic Engineering Section.

The supervisory staff consisted of the Traffic Engineer, the Supervisor and Assistant Supervisor of the Accident Study Speed Control and Spot Improvement Safety Program Unit. Cooperation and services within the Department, upon official request, were rendered by various personnel from the Photography Section, Blueprint and Plan File Rooms, District Projects Personnel, Traffic-Maintenance field forces, and others from the Traffic Engineering Section.

As immediately as possible, following a pin-point determination of accident location, the engineering field study was begun, usually within a day or so of the date of the accident. On-site photographs, various notes and measurements were made relative to such items as road width, surface type and condition, pavement markings, geometrics, channelization, alignment, sight distance and grade, superelevation, the median, guard rail, lighting,

TRAFFIC ENGINEERING SECTION

Accident Analysis (cont'd)

skid marks, bridge details, curb type and reveal, and any other data deemed pertinent including weather conditions.

It is expected that such further research will prove worthwhile for a more specific determination of safer design specifications and types of materials involving such items as medians, median barrier and other guard rail, curb height and offset; bridge deck cross sectional design, including rails, abutments and wingwalls.

During fiscal 1969 the Department collated data for the third annual report, "State Highway Fatal Motor Vehicle Accidents 1968." The source information was obtained from record reports on file with the Registry of Motor Vehicles, and was compiled, assembled and published by the Accident Records Unit of the Traffic Engineering Section.

The Motor Vehicle Laws of Massachusetts require that for each traffic accident in the State causing death, injury, or property damage of \$200 or more, a report from each driver involved be sent to the Registry of Motor Vehicles to be processed initially and filed. Studies made from the information in these reports are used by the Traffic Engineering Section for such purposes as speed zoning, roadway signing and channelization,

TRAFFIC ENGINEERING SECTION

Accident Analysis (cont'd)

testing for signal warrants, pedestrian crossing, school zoning, highway lighting, removal of hazardous fixed objects, etc.

Further analysis of this information can also affect roadway construction and the determination of corrective measures for accident-prone locations for the Spot Improvement Safety Program.

TRAFFIC ENGINEERING SECTION

(FISCAL 1969)

HIGHWAY SAFETY

The following is a list of Highway Safety Improvement Projects that were awarded for construction during the fiscal year:

<u>Type of Improvement</u>	<u>Number of Projects</u>	<u>Cost of Projects</u>
Protective Guard rail	8	\$1,829,700
Highway Lighting	2	29,100
Signing	3	142,700
Signalization Intersection	12	94,800
Reconstruct Intersection	5	278,700
Reconstruct Section	3	509,600
Realignment Section	1	27,800
<hr/>		
Total	34	\$2,912,400
Federal aid projects	15	\$2,574,800
Non-Federal aid projects	19	337,600
<hr/>		
Total	34	\$2,912,400

TRAFFIC ENGINEERING SECTION

ADVICE TO CITIES AND TOWNS

The processing and approval of municipal traffic regulations at the District office level has progressed in a most satisfactory manner. Delay is at a minimum and the more personal contact afforded between municipal officials and District personnel has proven advantageous. All Districts except District 8 are now performing this function and District 8 will be so operating shortly.

Seven municipalities completely revised their regulations and three towns which had no prior regulations were assisted in adopting full sets of controls.

Legislative reports on pending bills numbered slightly over two hundred and appearances before legislative committees totalled fifty seven.

Approximately fifty summonses of Department records were answered in court.

During this year this section executed major agreements with the City of Springfield in relation to Routes I-91 and I-291 and Page Boulevard, (Route 20A). This was also done in connection with Routes I-93 and I-695 for the City of Somerville. A number of lesser agreements were also completed with other municipalities such as Groveland, Halifax, Tisbury.

TRAFFIC ENGINEERING SECTION

Advice to Cities and Towns (cont'd)

This section also prepared Traffic Control Agreements for all municipalities concerning TOPICS and safety projects where Federal funds are expended.

Following is a tabulation of Traffic Permits issued:

	New	Revised	Cancelled
Pedestrian Regulations	11	0	0
Traffic Control Signals	150	45	0
Warning Beacons	34	1	0
Isolated Stop Signs	195	2	0
Town Regulations	249	0	0
Yield Signs	16	0	0
Figurines	3	0	0
Traffic Signs	8	0	0
Special Permits	0	0	0
Safety Islands	43	3	0
Street Marking Signs			
Pavement Markings	3	0	0
Tow Away Zones	1	0	0
School Zones	39	2	0
State Highway Regulations	0	0	0
	<hr/>	<hr/>	<hr/>
Total	1049	53	0

TRAFFIC ENGINEERING SECTION

SPEED CONTROL

A priority schedule for Speed Control Operations was continued in the fiscal year 1968 - 1969.

Comprehensive engineering studies for each highway tested were employed using Radar speed meters to measure vehicular speeds, ball bank indicators to test each horizontal curve encountered and trial runs to evaluate the practicality of the maximum safe speed.

Speed limits were approved jointly by the Department and the Registry of Motor Vehicles on the following State Highways.

<u>RTE. NO.</u>	<u>CITIES/TOWNS</u>	<u>REGULA- TION NO.</u>	<u>DATE APPROVED</u>	<u>NO. OF MILES/ROUTE</u>
63	Amherst-Northfield	419	7-23-68	22.06
M.S.H.	Northampton-Hatfield	420	7-23-68	0.23
10	Bernardston-Northfield	156A	7-23-68	6.38
30	Framingham-Westboro	418	7-24-68	7.65
M.S.H.	Framingham-Southboro	417	8-9-68	0.33
88	Westport	314B	8-9-68	3.60
6	Eastham-Wellfleet	401A	9-12-68	10.16
24	Fall River	435	12-19-68	1.79
3	Quincy-Hanover	434	12-19-68	10.68
24	Fall River	436	12-19-68	0.96
M.S.H.	Amesbury-Salisbury	431	12-19-68	3.44
140	Taunton-New Bedford	109E	11-1-68	11.75

TRAFFIC ENGINEERING SECTION

Speed Control (cont'd.)

<u>RTE. NO.</u>	<u>CITIES/TOWNS</u>	<u>REGULA- TION NO.</u>	<u>DATE APPROVED</u>	<u>NO. OF MILES/ROUTE</u>
I-495	Westborough-Hopkinton	308C	11-6-68	5.21
M.S.H.	Fall River	415	11-6-68	0.34
I-295	No. Attleboro-Attleboro	382A	11-6-68	3.59
I-495	Amesbury-Salisbury	308D	11-19-68	3.41
I-495	Foxboro-Bellingham	440	1-20-69	11.44
2	Lexington-Lancaster	451	2-19-69	23.89
43	Williamstown	450	2-19-69	4.76
M.S.H.	Burlington	445	2-19-69	0.36
1A	Revere-Salisbury	441	2-14-69	29.71
I-290	Auburn-Worcester	439	2-14-69	5.10
128	Needham-Braintree	243A	3-24-69	17.00
M.S.H.	Peabody	246A	3-24-69	2.30
2	Savoy-Williamstown	452	3-14-69	20.20
M.S.H.	Lincoln	453	3-14-69	0.59
M.S.H.	No. Andover	460	4-23-69	1.89
M.S.H.	Amherst	459	4-23-69	0.83
70	Shrewsbury-Clinton	466	5-21-69	9.17
9	Pittsfield-Northampton	463	5-21-69	36.41
3	Woburn	42C	5-21-69	0.95
1A	Hamilton	441A	6-12-69	<u>0.50</u>
Total miles				256.68

TRAFFIC ENGINEERING SECTION

Speed Control (cont'd.)

Special Speed Regulations were reviewed and approved on the following City and Town ways by the Department of Public Works and the Registry of Motor Vehicles.

<u>CITY/TOWN</u>	<u>No. of Streets</u>	<u>Regulation No.</u>	<u>Date Approved</u>
Saugus	1	407A	8/20/68
Sterling	2	422	8/20/68
Colrain	1	427	9/4/68
Lenox	2	336-A	9/4/68
Hamilton	6	428	9/12/68
Brookline	7	423	9/12/68
Millbury	5	425	9/12/68
Randolph	1	424	9/19/68
Whately	1	430	10/31/68
Hatfield	3	421	10/31/68
Ipswich	10	50A	11/6/68
Fall River	2	416	11/6/68
Cambridge	2	432	11/19/68
Rochester	6	426	11/19/68
Bolton	4	437	12/19/68
Stoneham	2	438	1/20/69
Williamstown	1	442	2/14/69
Burlington	3	446	2/19/69

TRAFFIC ENGINEERING SECTIONSpeed Control (cont'd.)

<u>CITY/TOWN</u>	<u>No. of Streets</u>	<u>Regulation No.</u>	<u>Date Approved</u>
Marshfield	5	449	2/19/69
Hudson	10	448	2/14/69
Westfield	1	447	3/14/69
Clarksburg	3	443	3/14/69
Sheffield	1	458	4/1/69
Rutland	1	457	4/1/69
Hubbardston	1	455	4/1/69
Holden	1	456	4/23/69
Rockland	2	461	5/21/69
Canton	1	464	6/12/69
Marshfield	9	462	5/21/69
Topsfield	2	212A	6/12/69
Tyngsborough	1	467	6/23/69
Sherborn	<u>1</u>	<u>465</u>	6/23/69
	98	32	

Technical traffic engineering advice was given to the following cities and towns to aid them in their preparation to obtain Special Speed Regulations:

TRAFFIC ENGINEERING SECTION

Speed Control (cont'd)

ADVICE TO CITIES AND TOWNS

Bolton	7-11-68	Plymouth	9-18-68
Boylston	6-19-69	Raynham	9-24-68
Cambridge	7-29-68	Rutland	10-21-68 .
Canton	10-1-68	Sheffield	11-6-68
Chester	3-16-69	Stoneham	9-6-68
Chilmark	6-4-69	Townsend	9-17-68
Colrain	7-23-68	Tyngsborough	7-1-68
Dennis	4-23-69	Westfield	9-6-68
Edgartown	6-4-69	West Tisbury	6-4-69
Egremont	8-19-68	Woburn	4-3-69
Granville	6-9-69		
Holden	10-21-68		
Hubbardston	10-21-68		
Hudson	7-23-68		
Marshfield	10-16-68		
Medway	11-18-68		
Methuen	8-8-68		
Natick	4-14-69		
North Brookfield	5-13-69		
Norfolk	3-21-69		
Oak Bluffs	7-30-68		

TRAFFIC ENGINEERING SECTION
CHAPTER 519, ACTS OF 1967

CITY AND TOWN WAYS

JULY 1, 1968 - JUNE 30, 1969 PROGRESS REPORT

Pursuant to Chapter 519, Acts of 1967 the following policies and procedures were established to define and identify high accident locations and to establish the administrative process necessary for the implementation of the Act, also the work being done conforms with the National highway safety policies.

Standards were developed as follows:

1. The Department Manual on Uniform Traffic Control Devices shall be used to govern the definition, design, scope and usage of such devices.
2. Identification of high accident and hazardous locations, intersections or sections of streets and highways will be guided by the number of accidents as related to traffic volume exposure. This identification shall be based on accident data obtained over a sufficient period of time to insure statistical reliability. The statistical Method of procedures, including accident reduction and cost effectiveness forecasts for safety improvements, shall be provided by the Traffic Engineering Section.

TRAFFIC ENGINEERING SECTION

Chapter 519, Acts of 1967
City and Town Ways (cont'd.)

3. Safety improvements under this act will generally be construed as:
- a. Channelization of Intersection
 - b. Provisions of additional traffic lanes on approaches to signalized intersections.
 - c. Provisions of grade separations.
 - d. Addition or improvement of pavement markings, signs, or other devices required in connections with the application of engineering techniques to improve the safety of vehicular or pedestrian traffic.

Following is a list of approved safety projects:

Area #1

Pittsfield, North Adams, Westfield, Clarksburg and Great Barrington - a total of 20 projects that have been approved for \$324,000.

Area #2

Chicopee, Leominster, Northbridge, Gardner, Springfield, Greenfield, Ludlow, Holyoke and Southbridge - a total of 25 projects that have been approved for \$356,150.

Area #3

Cambridge, Danvers, Georgetown, Haverhill, Malden, Somerville, Medfield, Melrose, Millis, Waltham, Watertown, Belmont, - a total of 16 safety projects that have been approved for \$350,000.

TRAFFIC ENGINEERING SECTION

Chapter 519, Acts of 1967
City and Town Ways (cont'd.)

Area #4

Abington, Bridgewater, West Bridgewater, Plympton, Plymouth, Brockton, Fall River, Whitman, Rehoboth and Attleboro - a total of 16 safety projects that have been approved for \$80,000.

Area #5 (Suffolk County)

Dorchester, Charlestown, Boston, and Chelsea - a total of 10 safety projects that have been approved for \$124,000.

A total of 71 Safety Projects with an estimate cost of \$1,234,000.

It was necessary for the Traffic Engineering Section to provide guide lines for the establishment of before and after studies and for the calculation of priority listing.

It is anticipated that applications under Chapter 519, will increase in volume and that the program will continue in future years. Fully documented data can be of significant importance in the event that Federal Reimbursement is obtained at a later date.

TRAFFIC ENGINEERING SECTION

TRAFFIC SIGNS AND PAVEMENT MARKINGS

This section of the Annual Report covering the fiscal year ending June 30, 1969 deals with the following traffic engineering phases:

Traffic Signing:

Contract

Department Forces

Standard - New and Replacement

Experimental

Special

Pavement Markings:

Reviewing Contract work

Detailing work by Department Forces

Route Changes

UPDATING OF TRAFFIC SIGNS

448 Sign Erection reports were received from the District and were used to record the updating of existing signs.

The breakdown by Districts is as follows:

District 1	53 Reports
District 2	42
District 3	94
District 4	66
District 5	53
District 6	90

TRAFFIC ENGINEERING SECTION

Traffic Signs and Pavement Markings (cont'd)

District 7	25 Reports
District 8	25
Total	<div style="border-top: 1px solid black; display: inline-block; width: 50px;"></div> 448 Reports

These reports indicate that there has been no appreciable change in the status of conforming signs which was previously reported as follows:

Primary roads	93.0 percent
Secondary roads	84.0 percent

TRAFFIC SIGN SPECIFICATIONS

Section 825, a supplement to the 1967 Standard Specification for Highways, Bridges and Waterways, entitled "Supplementary Specifications for Traffic Signs and Supports" was employed on all advertised projects commencing in August 1968.

CURRENT SIGN POLICY

On February 26, 1969 the Commission approved a new sign policy which was distributed as S.O.P. # HED-70-30-1-000. This S.O.P. superseded C.L. #65-42 dated November 17, 1965, and became effective April 15, 1969. The new policy was formulated in order to clarify some of the points in our then current sign policy and to amend this policy to allow graphic signing to hospitals, airports and telephones on limited access state highways.

TRAFFIC ENGINEERING SECTION

Traffic signs and Pavement Markings (cont'd)

In regards to Chapter 862, Acts of 1967 (Services Signs) the Department processed and installed signs at the request of four owners of service facilities on limited access highways. Involved was a total of \$6,525.00 in initial fees and a total of \$925.00 in annual fees. These application were processed under Standard Operating Procedure No. HED-70-05-1-000.

ROUTE CHANGES

During the year there were 9 Route Changes made and are as follows:

Route 97 - Relocated to Ginty Boulevard - Haverhill

Route 86 - Redesignated to Route 286 - Salisbury

Route I-84 - Redesignated to Route I-86 - Sturbridge to

Connecticut State Line

Route I-895 - Established in Attleboro, Rehoboth and Swansea

Route 79 - Extension - Fall River

Route 5A - Eliminated in Agawam and West Springfield

Route 159 - Established over former Route 5A - Agawam

Route 104 - Relocated 0.4 miles - Bridgewater

Route 240 - Established between U.S. Route 6 and Route I-195

(not constructed) - Fairhaven

SIGN FABRICATION

The Wellesley Sign Shop has fabricated 16,976 signs for the year. The types of signs are listed:

TRAFFIC ENGINEERING SECTION

Traffic Signs and Pavement Markings (cont'd)

Directional (Trapazoidal Tops) XLD's	544
Directional (Billboards)	503
Miscellaneous (Billboards)	743
Route Markers	2,560
Regulatory (Standard)	4,897
Regulatory (Stop)	604
Warning (Standard)	2,257
Warning (Billboard)	585
Rest Area	79
Tabs	805
Others	
Town Line	100
Memorial	63
River	20
Miscellaneous	<u>3,216</u>
Total	16,976

STANDARDS - TRAFFIC SIGNS AND SUPPORTS

During the month of May a standard was adopted based on concepts developed in a cooperative research program of the Texas Transportation Institute and the Texas Highway Department for ground mounted sign supports for plywood sign panels with an area over 40 s.f. This standard is now in the process of being reviewed by the U.S. Department of Commerce, Bureau of Public Roads.

TRAFFIC ENGINEERING SECTION

Traffic Signs and Pavement Markings (cont'd)

Standards were developed, utilizing aluminum, for structural supports for overhead signs with variable sign areas. They were submitted to the U.S. Department of Commerce, Bureau of Public Roads and due to the lack of standards utilizing steel, they were approved as TYPICALS on a project to project basis.

Additional standard drawings were developed, depicting sign face details, for warning and regulatory type signs.

CONTRACT PROJECTS

During the year the approximate cost of traffic signs and pavement markings which were included in contract projects designed by this Unit was \$4,093,313.00.

The number of signs and length of pavement markings included in the contracts are listed below:

Overhead Signs		145
Ground Mounted Signs (20 S.F. or over)		294
Ground Mounted Signs (Under 20 S.F.)		222
Delineators		13827
Warning Clusters)	
)	
Abutment Warning Panels)	
)	
Route Markers)	2344
)	
Regulatory)	
)	
Warning)	

TRAFFIC ENGINEERING SECTION

Traffic Signs and Pavement Markings (cont'd)

Mile Markers	482
Tenth-of-Mile Markers	4272
Reflectorized White & Yellow Lines (painted)	543,300 lf
Reflectorized White & Yellow Lines (thermoplastic)	427,445 lf

Note: - Signing & Pavement Markings were designed for numerous Chapter 519, Chapter 90 Safety and Force Account projects and this work does not reflect in the above totals.

During the year a continuing Traffic Seminar Program, that was initiated prior to this fiscal year, was continued. This Section prepared lecture presentations, conducted discussion periods and workshop sessions when the topic of the Seminar pertained to Signing and Pavement Markings.

TRAFFIC ENGINEERING SECTION

TRAFFIC CONTROL SIGNALS AND HIGHWAY ILLUMINATION

The Traffic Control Signal and Highway Illumination Unit is responsible for the engineering of traffic control signals and highway lighting for State Highways. The Unit is also responsible for issuing permits for traffic signal installations on city and town ways.

The Signal Control segment of the Unit has maintained and been responsible for the following work programs:

1. Review and processing of new signal installation layouts and specifications. (19 Projects)
2. Review and processing of layouts and specifications for the Signal Updating Program (28 Projects)
3. Issuing of Permits for city and town traffic signal installations (new 184, revised 46). Giving technical advice to cities and towns concerning their traffic control problems.
4. Review of proposed traffic signal installations on State Aid (Chapter 90) Projects.
5. Review of proposed traffic signal installations for the Chapter 519 program

TRAFFIC ENGINEERING SECTION

Traffic Control Signals and Highway Illumination (cont'd)

The Highway Illumination segment of the Signal and Lighting Unit has, over the past year, made in-house lighting designs and has reviewed consultant design projects. The Lighting Segment, throughout the year, has given technical advice to the District Offices and to the Construction Division in the field.

We have, during the year, continued our various special lighting programs. An eighty foot tower lighting project has recently been completed on Route 128 in the City of Gloucester at the Grant traffic circle. From our primary experience with this installation it would appear that the light source on this tower is performing satisfactorily in that it imparts to the driver positive illumination of the traffic circle. It is felt that this lighting will greatly improve traffic safety in this area. Further east on Route 128 we have installed four forty foot light standards with four area lighting type luminaires to illuminate the Blackburn Circle. To date we have not fully evaluated these lights regarding their performance in the field.

As there are ever changing technologies and products being developed by the Traffic Control Signal and Highway Lighting industries the unit has initiated several pilot installations of these products so that we may get a better understanding of their performance for future contract installations.

TRAFFIC ENGINEERING SECTIONTraffic Control Signals and Highway Illumination (cont'd)

The Signal and Lighting unit is charged with the responsibility of approving new products that manufacturers have introduced for use in our State Highway signal and lighting installations.

Shop drawings and equipment to be used on State Highway construction projects are also reviewed for approval by the Unit.

We are continuing with our programs in the various fields of automated highway control. The H.W. Lochner Company, Inc. is currently in the second year of their three year contract with the Department. The H.W. Lochner Company, Inc. is designing an operational automatic surveillance and control system for the Inner Belt (Route 695) in Boston. Portions of the system design that have received the greatest emphasis this past year are the Dewey Square Tunnel Matrix Signing Pilot Project, the General System Plan, the Control Center Requirements and the Computer Specifications. We have given special attention to the Control Center Operational Personnel requirements as there is a considerable amount of background work necessary prior to the establishment of an Operational Staff for the Control Center.

The Raytheon Company, Inc., under contract with the Bureau of Public Roads, is also continuing with the Merging Control Project experiment on the northwest ramp of the Route 128 - Route 38

TRAFFIC ENGINEERING SECTION

Traffic Control Signals and Highway Illumination (cont'd)

interchange in Woburn. To date the system has not been made operational for public use. It is currently being programmed and calibrated. The prime purpose of this project is to determine the degree of acceptance by the motorist of the gap acceptance concept.

STATE AID SECTION

The State Aid Section has the responsibility of processing the payment of State Funds to the Cities and Towns in the Commonwealth for the improvement and maintenance of local roads.

CHAPTER 90

Generally, the State pays one-half the cost of construction and improvement projects with the County and the Municipality each contributing one-fourth. Maintenance assignments are usually divided equally with the State, County and Municipality, each contributing an equal share of one-third. The Chapter 90 tentative assignments for 1969 total \$16,758,650.00 with the State's share amounting to \$7,999,400.00.

TENTATIVE 1969 CHAPTER 90 ASSIGNMENTS

SUMMARY

COUNTY	STATE	TOWN	COUNTY	TOTAL
BARNSTABLE	\$ 261,400	\$ 138,950	\$ 138,950	\$ 539,300
BERKSHIRE	494,350	298,525	299,275	1,092,150
BRISTOL	611,800	328,550	328,550	1,268,900
DUKES	44,000	25,000	25,000	94,000
ESSEX	730,500	377,400	361,200	1,469,100
FRANKLIN	366,600	216,050	216,050	798,700
HAMPDEN	629,650	346,350	346,350	1,322,350
HAMPSHIRE	333,550	195,875	195,875	725,300
MIDDLESEX	1,476,400	772,750	780,150	3,029,300
NANTUCKET	28,900	28,900	---	57,800
NORFOLK	633,100	349,350	349,350	1,331,800
PLYMOUTH	530,200	282,100	285,100	1,097,400
SUFFOLK	618,100	618,100	---	1,236,200
WORCESTER	1,240,850	727,750	727,750	2,696,350
TOTALS	\$7,999,400	\$4,705,650	\$4,053,600	\$16,758,650

STATE AID SECTION

CHAPTER 81

Section 26 Chapter 81 of the General Laws provides for the expenditure of funds for the repair and improvement of public ways other than State Highways, in the 182 towns eligible for Chapter 81 participation. The work consists of patching, widening, reshaping as well as surface treating with bituminous materials.

The Chapter 81 program for the year 1969 amounts to \$3,554,880.00 with the State's share as \$2,726,075.00.

CHAPTER 81 - SECTIONS 26-29 - GENERAL LAWS AS AMENDED
TOWNS UNDER \$5,000,000 valuation - LESS THAN 12.00 ROAD MILEAGE RATIO
VALUATION IN ACCORDANCE WITH CHAPTER 81, SECTION 26 GENERAL LAWS

County	No. Towns	Miles	-1.40	-2.00	-2.80	-3.50	-5.50	-7.00	-9.00	-12.00
			\$15.00	\$25.00	\$40.00	\$50.00	\$75.00	\$100.00	\$125.00	\$150.00
Barnstable	7	392	-	-	-	-	1	5	1	-
Berkshire	23	1007	5	2	4	5	5	1	-	1
Bristol	7	454	-	-	-	-	3	2	-	2
Dukes	3	35	-	-	-	-	1	-	2	-
Essex	10	410	-	-	1	-	-	2	3	4
Franklin	23	1173	6	1	3	3	4	1	3	2
Hampden	12	667	1	2	3	1	3	1	1	-
Hampshire	15	769	3	3	2	2	2	1	1	1
Middlesex	24	1524	-	1	1	1	5	3	7	6
Norfolk	6	300	-	-	-	-	1	1	2	2
Plymouth	8	385	-	-	-	-	2	4	-	2
Worcester	44	2797	1	4	1	3	14	8	8	5
	182	9913	16	13	15	15	41	29	28	25

Towns	Road Mileage Ratio		Miles	Rate Per Mile		Towns Pay	State Pays
16	-	1.40	790	\$	15.00	\$ 11,850	\$ 217,250
13	-	2.00	589		25.00	14,725	161,975
15	-	2.80	817		40.00	32,680	224,675
15	-	3.50	896		50.00	44,800	246,400
41	-	5.50	2343		75.00	175,725	644,325
29	-	7.00	1661		100.00	166,100	456,775
28	-	9.00	1585		125.00	198,125	435,875
25	-	12.00	1232		150.00	184,800	338,800
182			9913			\$828,805	\$2,726,075

STATE AID SECTION

BOND ISSUE FOR IMPROVEMENT OF LOCAL ROADS

In accordance with Section 5 of Chapter 616 of the Acts of 1967, which was approved on September 13, 1967 the State Aid Section has the responsibility of processing the distribution of \$10,000,000.00 to the Cities and Towns of the Commonwealth.

Following is a tabulation showing in the aggregate payments authorized to the Cities and Towns in each County.

<u>COUNTY</u>	<u>AMOUNT</u>
Barnstable	\$ 232,080.68
Berkshire	345,379.28
Bristol	652,407.74
Dukes	35,445.92
Essex	1,002,135.02
Franklin	234,484.78
Hampden	794,381.34
Hampshire	216,722.98
Middlesex	2,057,070.68
Nantucket	26,380.48
Norfolk	947,743.16
Plymouth	476,549.12
Suffolk	1,828,214.90
Worcester	<u>1,151,003.92</u>
<u>GRAND TOTAL</u>	\$10,000,000.00

RESEARCH AND MATERIALS SECTION

The Research and Materials operated in accordance with its established responsibilities.

The quality of materials used in the construction and maintenance of highways was controlled by a program of laboratory testing and inspection at plants manufacturing certain materials. A program of job control testing in conformance with Bureau of Public Roads requirements was continued. Quality control services were provided for State Highway projects having a contract value in excess of 225 million dollars as well as for maintenance and State Aid projects.

Administrative responsibility over all Department sponsored research activities continued. The Research and Materials Section, in addition, had technical cognizance over materials oriented research. Research projects, co-sponsored by the Bureau of Public Roads, with the Massachusetts Institute of Technology, University of Massachusetts and the U.S. Geological Survey are among those currently underway. In addition, the Research and Materials Section is carrying on a limited program of in-house research activities as well as a program of evaluation of new products and materials for highway use. A new publication entitled Report on Research Activities is prepared and distributed nationally on a quarterly basis by the Research and Materials Section.

RESEARCH AND MATERIALS SECTION

Staffing additions have permitted limited increases in the activities of the Soils and Foundation Unit of this Section. Soils exploration activity has continued with one field boring crew engaged full time in this work. Utilization of the services of the Soils and Foundation Unit has, in several instances, resulted in both monetary savings and in more rapid availability of required design information.

Attendance at seminars both within and outside of the Commonwealth has enabled supervisory personnel to keep current with respect to the latest methods for the use and testing of highway materials and also the latest information in the area of highway oriented research.

C

CONSTRUCTION SECTION

The Construction Section of the Department of Public Works during the 1969 Fiscal Year supervised the inspection of 30 miles of highway construction and of related work to the value of more than \$82,000,000.

The largest single contract in Boston and Somerville was awarded for just under \$23,000,000, although its length was less than one mile. The second largest contract was for approximately \$10,500,00 in Springfield for a distance of just under one-half mile. Demolition of structures in advance of highway construction accounts for more than \$1,600,000.

Our Safety Program, consisting principally of the installation of highway guard in median strips was continued at a cost of \$2,600,000, and the installation of signs at a cost of \$1,500,00.

Our Highway Beautification Program continued at a much slower pace and accounted for \$350,000.

Bridge reconstruction or improvement work accounted for \$2,000,000.

One of our smallest projects was the construction of a bicycle path on Nantucket Island.

A detailed analysis of the projects started during the 1969 Fiscal Year follows:

CONSTRUCTION SECTIONPROJECTS AWARDED DURING FISCAL 1969

	<u>I-91</u>		<u>BID</u>
DANVERS-PEABODY	#14499	1.660 Miles	\$4,780,579.45
DEERFIELD-GREENFIELD- WHATELY	#14335	Landscaping	71,543.30
EASTHAMPTON-HATFIELD- HOLYOKE-NORTHAMPTON	#14235	Landscaping	106,457.00
HOLYOKE	#14169	Signs	208,922.00
HOLYOKE	#12940	Ramp	400,077.00
SPRINGFIELD	#14200	0.486 Miles	10,641,865.75

	<u>I-93</u>		
BOSTON-SOMERVILLE	#12935	Demolition	20,600.00
MEDFORD	#14139	Rem. Temp. Fill	711,490.00
SOMERVILLE	#14179	Demolition	54,550.00

I-93 & Rte. 128

READING-STONEHAM	#14347	Signs	38,488.75
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I-93 & I-495

ANDOVER-LAWRENCE METHUEN-NORTH ANDOVER	#13042	Signs	679,630.00
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I-95

BOSTON	#14032	Demolition	497,250.00
BOSTON	#14033	Demolition	516,000.00
BOSTON	#14122	Demolition	297,000.00
FOXBOROUGH	#12998	Landscaping	89,550.50

I-195

DARTMOUTH	#13075	Ramp	564,754.40
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CONSTRUCTION SECTION

- 3 -

I-195, 138 & 24Bid

FALL RIVER-WESTPORT	#14372	Signs	\$ 477,957.00
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I-291

SPRINGFIELD	#14250	2.141 Miles	6,705,584.70
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I-495

AMESBURY-MERRIMAC	#14168	Safety	40,695.00
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ANDOVER-LAWRENCE NORTH ANDOVER	#14221	Landscaping	88,369.50
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I-695

BOSTON-SOMERVILLE	#14234	0.895 Miles	22,877,486.00
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PRIMARY, SECONDARY AND URBANROUTE 2

GARDNER-TEMPLETON	#14220	2.067 Miles	3,685,347.60
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PHILLIPSTON-TEMPLETON	#14223	1.700 Miles	3,597,603.55
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TEMPLETON	#14541	3.685 Miles	7,328,631.50
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ROUTE 3

PLYMOUTH to WEYMOUTH	#13024	Safety	205,482.00
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ROUTE 7

WILLIAMSTOWN	#14158	Safety	27,751.45
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ROUTE 9

NORTHBOROUGH-SHREWSBURY WESTBOROUGH	#13089	Hwy. Gd.	92,972.25
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ROUTE 10

BERNARDSTON-GILL-	#14456	2.254 Miles	4,951,428.50
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NORTHFIELD			
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ROUTES 10 & 202

SOUTHAMPTON-WESTFIELD	#14198	2.178 Miles	801,930.10
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CONSTRUCTION SECTION

- 4 -

ROUTES 18 & 140BID

NEW BEDFORD	#14346	Signs	\$ 69,463.00
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ROUTE 20

WESTFIELD	#14493	Safety	484,536.56
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ROUTE 24

AVON to RAYNHAM	#14451	Safety	493,769.00
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FALL RIVER-RAYNHAM	#14450	Safety	331,130.75
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ROUTE 41 & DIVISION ST.

GREAT BARRINGTON	#13079	Safety	21,260.50
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ROUTE 43

HANCOCK	#14511	2.207 Miles	957,389.00
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ROUTE 44

CARVER-MIDDLEBOROUGH	#13025	4.344 Miles	1,448,027.90
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ROUTE 110

METHUEN	#14494	Safety	99,858.12
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ROUTE 128

BURLINGTON-LEXINGTON	#14141	Signs	83,469.00
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GLOUCESTER	#13072	Lighting	28,277.00
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GLOUCESTER to PEABODY	#13057	Safety	507,404.50
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LEXINGTON-WOBURN	#14537	2.715 Miles	1,535,032.00
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ROUTE 140

FREETOWN-LAKEVILLE	#12931	2.522 Miles	1,917,260.92
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ROUTE 146

MILLBURY	#14159	Safety	46,832.00
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CONSTRUCTION SECTION

- 5 -

ROUTE 202BID

GRANBY	#14441	Safety	\$ 72,664.30
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BALLARD ST. to ESSEX

FALL RIVER	#14045	Demolition	234,080.00
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MISCELLANEOUS NON FEDERAL AID PROJECTSROUTE 6

BOURNE	#12941	Safety	7,550.00
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ROUTE 23

RUSSELL	#14052	Safety	20,700.00
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ROUTE 28

BARNSTABLE	#13039	Safety	18,078.50
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ROUTE 30

SOUTHBOROUGH-WESTBOROUGH	#14240	2.178 Miles	578,758.50
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ROUTE 1A

REVERE	#14516	0.151 Miles	66,720.00
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ROUTE 2

CONCORD-LEXINGTON-LINCOLN	#13056	Safety	111,424.00
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ROUTE 3A

BURLINGTON	#13006	Traffic Betterment	6,241.00
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ROUTE 114

PEABODY	#12938	Bridge Reconstruction	52,068.75
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ROUTE 128

BEVERLY	#13085	0.166 Miles	160,273.75
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BRIDGE STREET, BEVERLY

BEVERLY	#14137	Bridge Repairs	93,350.00
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CONSTRUCTION SECTIONBRIDGE STREET, DARTMOUTHBID

DARTMOUTH	#14182	Bridge Improvement	\$ 391,670.00
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S. E. EXPRESSWAY

BOSTON	#12911	Bridge Reconstruction	529,605.00
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S. E. EXPRESSWAY, EXIT 15

BOSTON	#14049	Safety	24,621.00
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NASHUA STREET

BOSTON	#13055	MDPW Parking Lot	13,658.50
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BOSTON	#14030	MDPW Parking Lot	37,665.00
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NICHOLS STREET

WILMINGTON	#14100	Bridge Relocation	317,281.00
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HANCOCK STREET

QUINCY	#14037	Bridge Reconstruction	663,302.50
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REED STREET

RANDOLPH	#12997	(Part Chap. 90)	12,877.00
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MILESTONE ROAD

NANTUCKET	#12910	Bicycle Path	44,839.50
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SUMMARY

	<u>MILES</u>	<u>AMOUNT</u>
INTERSTATE	5.182	\$49,868,850.35
PRIMARY, SECONDARY & URBAN	23.672	29,021,601.50
NON FEDERAL AID	2.495	3,150,684.00
TOTALS	31.339	\$82,041,135.85

CONTRACT ENGINEER SECTION

The Contract Engineer's Section processes the bids for Federal Aid Projects requiring B.P.R. Concurrence, State Highway Construction Projects, Chapter 90 Projects, Maintenance Projects, Waterways Projects, Boring Projects, projects for the construction, reconstruction, alteration, remodeling, repair, or demolition of buildings under the provisions of General Laws, Chapter 149, and Right of Way Projects involving the sale of houses, and the leasing of State-owned property, from bid opening to award of contract and maintains all the necessary records therefor. The prequalification and post-qualification of contractors is administered by this Section and the issuance of Proposal Forms and plans to prospective bidders requires the approval of this Section. Force account agreements with public utilities, cities and towns are reviewed for approval.

MAJOR ACTIVITIES

1. At bid openings all proposals are publicly opened and read subject to verification for arithmetical correctness, examination for informalities and compliance with applicable statutes.

2. After a bid opening all proposals are immediately checked for compliance with requirements. Proposals that are unacceptable due to incompleteness, irregularities, collusion, qualifying clauses, etc., are duly noted and if the deviation is a matter of substance that is prejudicial to the rights of other bidders a recommendation for rejection of such bid is made.

CONTRACT ENGINEER SECTION

MAJOR ACTIVITIES (cont'd)

On the other hand, a deviation may be merely a matter of form or some immaterial variation from the exact requirements that can be waived by the Commission under the right reserved. In the latter instance, if such bid is the lowest bid submitted, a recommendation will be made that the informality be waived and the project awarded to this low bidder as being in the best interest of the Department. After all bids have been checked and verified a "Summary of Bids" is prepared, printed and collated for distribution to interested Sections, Divisions, District of the Department, contractors who bid on the particular project, and local trade magazines and publications. Copies are retained for the Sections records.

3. Letters recommending award or rejection are prepared and typed by this Section for the Chief Engineer's signature for presentation to the Board. Such letters are routed to our Fiscal Section for an assignment of funds. For work involving Federal Funds, letters are also prepared and typed for the Chief Engineer's signature, requesting Bureau of Public Roads concurrence in the award or rejection of contracts as required by Federal Regulations.

4. Prequalification Statements submitted by contractors as required by General Laws, Chapter 29, Section 8B are analyzed, computed, and a Rating determined for submission to our Pre-qualification Committee.

CONTRACT ENGINEER SECTION

MAJOR ACTIVITIES(cont'd)

Performance Records of Contractors who have previously performed work for this Department are maintained in this Section, and are designed to provide facts and documented data on every completed project and the contractor's performance thereon. Such records provide a source of information for recommendations made by the Contract Engineer to the Prequalification Committee for the determination of Prequalification Ratings or limitations thereon as warranted by the facts.

5. For projects for which prequalification is not required, the low bidder and/or the lowest responsible bidder must submit a post-qualification statement, duly signed and sworn to, outlining his experience, equipment and financial resources on forms supplied by this Department. These post-qualifications statements are computed and analyzed exclusively by this Section and on the basis of the computation and analysis a recommendation for award or rejection is made to the Board.

6. Since the enactment of the Prequalification Statutes all requests for Proposals and Plans for bidding purposes have to be cleared and approved by this Section. This policy was adopted so as to prevent the issuance of Proposals and Plans to contractors who are ineligible to bid because of failure to meet the requirements of the Prequalification Statute and Regulations.

7. Records of all activities of this Section are maintained for purposes of documentation and a source of information.

CONTRACT ENGINEER SECTION

MAJOR ACTIVITIES (cont'd)

(a) A complete alphabetical file of all contractors who have performed work for this Department is kept current at all times. This file shows the location of each project which the contractor has performed, the advertising date, bid opening date, bid amount, date of award, and starting and completion dates.

(b) A card index file for each project awarded, showing date of advertising, opening of bids, date of award, office estimate, bid price, contractor's name and address, contractor's qualification, start of construction, date of completion, extensions of time, if any, and contractor's performance record.

(c) A card file of projects awarded in each city or town, showing name of contractor, type of project, and the starting and completion date of all contracts performed within the city or town.

(d) Prequalified contractors, their prequalification rating and date of expiration.

(e) A list of "Active Bidding Contractors" who submit bids for any project for this Department each calendar year is prepared and maintained.

CONTRACT ENGINEER SECTIONMAJOR ACTIVITIES (cont'd)

PROJECTS AWARDED FOR FISCAL YEAR ENDING JUNE 30, 1969

NUMBER	CATEGORY	AMOUNT
44	Federal Aid	\$71,607,742.85
21	State Highway Construction	3,448,737.60
45	Chapter 90	6,186,143.57
328	Maintenance	7,495,310.44
36	Waterways	6,511,618.55
474	Total	\$95,249,553.01

During the fiscal year July 1, 1968 to June 30, 1969 a total of 270 Contractors were prequalified.

FINAL REVIEW SECTION

The work of the FINAL REVIEW SECTION consists of checking each of the quantities for the various items which represent the amount of work done by a contractor in constructing sections of Highway Bridge and other work done under contract with the Department of Public Works. This checking consists of reviewing all supporting data for each of the various items as recorded in manifold books, pile books, calculation books, time books and other records of the Resident Engineer; the plotting and sub-grading of final roadway, rock and peat cross-sections so that an accurate final pay quantity may be determined; and the computation of borrow pit quantities based on preliminary and final surveys of the borrow areas. After determining each of the final quantities of the various projects, a cost sheet is prepared so that the construction engineer and others may know the cost comparison with bid and allotment amounts, and a careful analysis is made between the Resident Engineer's quantities and the Final's quantities as well as between the Preliminary and Final quantities so that explanations of all differences which exceed 10% may be determined and prepared.

Greater use is being made of the computer for deriving accurate pay quantities for Roadway, Rock, Peat and Loam Stripping items. A recent innovation, the "Quality Control Ledger", that documents and expedites projects work has proven its worth to the satisfaction of all concerned.

FINAL REVIEW SECTION

"Pre-Final" review teams have been formed which consist of 2 or 3 men from the Final Review Section who are requested to visit various projects nearing completion and finalize items directly at the construction site. This operation reduces controversies and expedites the processing of the project because the availability of the Resident Engineer affords the opportunity to solve any differences of opinion immediately and effectively. This procedure has been accepted favorably by the Districts.

The following is a "Breakdown" of the value of contracts processed by the Final Review Section during the period from JULY - 1968 through JUNE - 1969

FINAL REVIEW SECTION

BREAKDOWN VALUE OF CONTRACTS PROCESSED BY THE FINAL
REVIEW SECTION

VALUE OF STATE HIGHWAY CONSTRUCTION CONTRACTS :

HAVING FEDERAL AID PARTICIPATION = \$ 45,359,621.17

VALUE OF STATE HIGHWAY CONSTRUCTION CONTRACTS :

NON-FEDERAL AID = 4,752,604.11

VALUE OF STATE AID (Chapter 90) CONTRACTS : = 6,547,513.95

VALUE OF MAINTENANCE CONTRACTS : = 8,141,090.95

VALUE OF MISCELLANEOUS CONTRACTS : = 4,527,791.81

(Includes Consultant Services, Boring
Contracts, Boston-(P.W.B. Contracts),
Traffic, etc.

TOTAL..... = \$ 69,328,621.99

NOTE :

Not included in the above totals are
forty-seven (47) Federal Estimates
(FINAL FEDERAL AID VOUCHERS) which
were submitted during the period of
JULY-1968 thru JUNE 1969.

PROCEDURES & RECORDS SECTION

I. PROJECT REVIEW

The continuing prime function of this Section has been the review of active Construction Projects as to compliance with Standard Operating Procedures, Contract Specifications and other controls necessary to assure a satisfactory product (Highways & Bridges). These in-depth Reviews are intended to develop uniformity in record keeping, adequate documentation and trained efficient field personnel. Attainment of these objectives will provide prompt reimbursement from the Federal Government.

A. PROJECT REVIEW REPORTS

During the past year, approximately one hundred (100) reports of project reviews have been prepared and submitted directly to the Chief Engineer with copies to the Construction Division and Research & Materials Division. Courtesy copies are being forwarded to the Bureau of Public Roads.

Reporting directly to the Chief Engineer permits the required independence and assures implementation of recommendations. Minor deficiencies noted during inspections are generally resolved at the Project or District level. The apparent necessary policy revision recommendations are prominently cited in the report.

B. QUANTITY CONTROL LEDGER AND/OR BOOK

Personnel of this Section have continued the practice of offering instructions to Resident Engineers and Office Engineers in the proper posting of the Quantity Control Ledger and/or book. This service has been well received in all Districts and is most beneficial to residents newly assigned to that position.

PROCEDURES & RECORDS SECTION

II. SPECIAL REVIEWS

A. MAINTENANCE DIVISION-CONTRACT MOWING

Following a request from the Department's Maintenance Engineer, instructions were received from the Chief Engineer to assign a team from this Section to assist in developing a uniform system of record-keeping, documentation and inspections procedures throughout the State for Advertised Maintenance Mowing Contracts.

Working in conjunction with the Boston Maintenance Office, a format was developed and introduced at Pre-Construction Conferences held in each of the eight (8) districts. At these meetings, the intent and requirements of the Contract Special Provisions and newly prepared Typical Sections were reviewed in-depth along with instructions on maintenance of records. In addition, slides were shown which effectively demonstrated both satisfactory and unsatisfactory work performance. These meetings were completed in April.

In June, a Review Team visited each of the 8 Districts to ascertain the effectiveness and workability of the new format. It was found that Department personnel interviewed were competent and well versed in the new Special Provisions with records maintained as required. A report to this effect was submitted to the Chief Engineer dated June 30, 1969.

B. ADVERTISED STATE AID CONSTRUCTION

As stated in the Annual Report for 1968, this Section conducted a Statewide Review of Advertised Chapter 90 Construction.

PROCEDURES & RECORDS SECTION

B. ADVERTISED STATE AID CONSTRUCTION (cont)

Following submission of a report of findings, personnel from this Section working in conjunction with the Boston State Aid Office, developed Standard Operating Procedures for State Aid. With the resumption of work this spring, random projects were reviewed in-depth. A review of the reports submitted by Review teams indicated that project records pertaining to compliance documentation and record-keeping procedures were satisfactory. Review Teams found construction practices acceptable and projects were being constructed in conformance with the approved plans and specifications.

In conclusion, it is judged that the Standard Operating Procedures have been effective as a means of initiating uniformity in record-keeping procedures throughout the Districts.

III. EQUAL EMPLOYMENT OPPORTUNITY

On October 8, 1968, the Department of Public Works endorsed the newly enacted EEO Provision of the Federal Aid Highway Act of 1968. With this endorsement, it was decided that this Section was ideally functional to initiate and administer the program. The Procedures and Records Engineer was named as the Department's Equal Employment Coordinator and the Section immediately commenced implementation of the program.

PROCEDURES & RECORDS SECTION

III. EQUAL EMPLOYMENT OPPORTUNITY (cont)

A letter was prepared for Commissioner Ribb's signature on November 26, 1968 and sent to some 300 contractors active in this State's construction program advising them of their responsibilities under FHWA Interim Order 7-2, and requesting them to submit individual Affirmative Action Program in order to become pre-qualified and eligible to bid.

Due to the stringent requirements set forth in this Order, it was necessary to personally meet with many of the Contractors to interpret the Order and to assist them in their submission of programs that would meet both the Department and Bureau of Public Road's approval. This culminated with the approval of 63 Contractors by March of 1969, with many more having programs pending approval. It must be noted here that this State was one of the leaders in this regard.

However, on March 17, 1969, we were informed that the U.S. Department of Transportation decided to replace the Prequalification procedure and, effective April 17, 1969, the EEO responsibilities would become part of the Contract Special Provisions for all Federal Aid Contracts and subcontracts in excess of \$10,000.00. A letter to this effect was prepared for the Commissioner's signature and sent to all effected Contractors.

The Section is now in the process of implementing as inspection program to police those contracts which are applicable to both Interim Order 7-2 and the recent Interim Order 7:-2(1).

PROCEDURES & RECORDS SECTION

III. EQUAL EMPLOYMENT OPPORTUNITY (cont)

Tentative guidelines have been set-up and a format similar to that expected to be used by Bureau of Public Roads Area Engineers has been formulated. Inasmuch as correspondence has been received from the Bureau stating that it is their intention to initiate their inspection of EEO in August, it is planned to review all those projects that are now under the provisions of EEO to insure that they are in compliance with Interim Orders 7-2 and 7-2(1).

Although the program is still in its early stages of development, it is apparent from initial reviews made, that this Section has been successful in impressing both Department and Contractor personnel of the importance in making a sincere effort in attaining full compliance and, thereby, attaining a meaningful program in this highly sensitive area.

IV. SPECIAL ASSIGNMENTS

A. STANDARD OPERATING PROCEDURES-FINAL REVIEW SECTION

As directed by the Chief Engineer, this Section, working in conjunction with the Finals Review Engineer, prepared proposed SOP's for the Finals Section. These SOP's set forth procedures for determining Final Quantities for payment to Contractors; reconciling results with the determination of Resident Engineer and proposed quantities, and preparing those quantities for Federal Aid Final Vouchers when applicable.

PROCEDURES & RECORDS SECTION

A. STANDARD OPERATING PROCEDURES-FINAL REVIEW SECTION (cont)

In addition, SOP's were prepared for formal receiving (inventory) final records for completed contract projects and also instructions for distribution of those final records upon completion of the Final Review.

In this area of work, it was brought to our attention that the Booklet " Standard Nomenclature & Designation of Items" was in process of being revised. Inasmuch as we were aware that the Finals Engineer had adapted this booklet for his use by including "Decimal Limits of Final Payment", it was our recommendation that great service would be derived if this was made available to Construction and Finals personnel. With the Chief Engineers approval, an interim summary was prepared by this Section, printed by the Specifications Section, with 300 copies to be distributed by the Construction Division.

B. STANDARD OPERATING PROCEDURES-CONTROL OF RECORDS TO BE RELEASED TO OUTSIDE AGENCIES

As a result of this Section many contracts with outside agencies, it became apparent that a more detailed procedure was required to control document release of official records when released and/or returned.

A report was submitted to the Chief Engineer and, at his direction, meetings were held with those responsible in this area to determine what problems they has and how to best rectify them.

PROCEDURES & RECORDS SECTION

B. STANDARD OPERATING PROCEDURES-CONTROL OF RECORDS TO BE RELEASED TO OUTSIDE AGENCIES(cont)

Following this, a Standard Operating Procedure was formulated which sets forth detailed instructions for control and documentation of any accountable records, contract documents, plans, etc., released to external agencies (i.e. Attorney General, U.S. Attorney, Grand Jury, Courts, etc.).

C. REVISION OF SOP-"SMALL TOOL ACCOUNTABILITY"

At the direction of the Chief Engineer, personnel of this Section investigated the confusion and resulting dissatisfaction with Standard Operating Procedure ADM-50-07-1-000. Based on the recommendations of the District Highway Engineers Committee who reviewed this matter, we conferred directly and indirectly with the various Divisions and State Agencies involved in this area.

Our review determined that the Department required separate accountability for Small Tools (manual implements) and Small Equipment (value less than \$100.00). Two (2) SOP's were proposed to supersede ADM-50-07-1-000 which would accomplish this end.

In addition to the foregoing, this Section is responsible for review (for the Chief Engineer) of all Standard Operating Procedures relating to engineering prior to their final approval and issuance. In this regard, the Section has developed many original SOP's working in conjunction with various Divisions, toward replacing or eliminating all active Circular Letters within the next year.

PROCEDURES & RECORDS SECTION

V. LIASION WITH OTHER AGENCIES

A. BUREAU OF PUBLIC ROADS

In addition to the specific duties previously described relative to the area of EEO, this Section has continued to act as the Department's Liasion with the Division Office of the Bureau of Public Roads.

Resolution of problems which resulted from the Special Audits and Investigations (A & I) Reports of the late fifties and early sixties have continued to involve us. Much progress has been attained toward the submission of Final Vouchers and resulting Final Reimbursement from the Federal Government.

The Section itself was the subject of a Special Audit Review by the Regional (Albany, N.Y.) Office and comments at that time indicated that the Department is unique and to be commended for its development of "In-House" review procedures of its construction projects. Copies of the resulting report can be anticipated shortly.

The Division Engineer's esteem for the Section is demonstrated by the following quote from his letter to Commissioner Ribbs dated October 17, 1968: " One of the management practices instituted by the Department that we believe has assisted in developing uniform construction operations and procedures is the review team approach by your Records & Procedures Section.

PROCEDURES & RECORDS SECTION

A. LIAISON WITH OTHER AGENCIES (cont)

Your new arrangement of record-keeping on construction projects adopted recently is a well-conceived and efficient system that has eliminated many problems and difficulties.

B. OTHER AGENCIES

The Section has continued its productive relations in liaison with the AHONAS and AASHO Organizations as directed by the Chief Engineer and Commissioner.

NERBA has been very cooperative in the implementation of EEO procedures through its membership and in providing contracts in Labor Unions.

We have also received excellent cooperation from the Commission Against Discrimination as well as Minority Group Organizations.

D

MAINTENANCE SECTION

The Maintenance Section was responsible for the physical maintenance and certain traffic services of 2,694 lineal miles of State Highway and 2,373 bridges.

The present total of 2,694 lineal miles represents a total of 9,176 lane miles as compared to 8,936 lane miles in Fiscal Year 1968.

MAPS AND STATISTICS UNIT

This unit maintains statistical data on all State Highways, such as length, width, thickness of pavement shoulders and foundations, year built and whether built under construction, reconstruction or resurfacing projects.

Maintenance expenditures, cost comparison and analyses are prepared by this unit as required by the Department.

The maintenance costs are reported by District and Activities. A cost per lane mile of each item is also shown.

Bridge and Highway Coding numbers are set up by this unit.

All highway data has been set up in the electric computer and breakdown of the data can be obtained as required for Department use.

All Districts are supplied with a tabulation of the State Highway by Repair Sections and broken down into Highway Routes, Towns, Types, width, lane and lineal miles, etc.

The Snow and Ice Control Schedule and maps are prepared in this office.

Atlases are also kept showing State Highway locations, Chapter 90 work by years, Highway Routes and Auto Routes. This unit also supplies and keep current, atlases for the Chief Engineer's Office, Projects, Maintenance Engineer and State Aid Offices.

A record of all construction work, both State Highway and Chapter 90 is kept. These records started in 1927 and are maintained by years.

The preparation and supervision of delineating and printing of the Official Highway Map and the October, March and June Detour Bulletins are also a function of this office.

Other maps prepared and available in this office are listed below:

1. State Highway map
2. Black and white route map
3. Town and City Line maps
4. Highway Route map
5. District line maps
6. District maps showing State Highway with highway route and mileages along State Highway indicated.

On an annual basis, the following reports are prepared:

M-1 Report (Detailed maintenance expenditures of selected sections of Interstate Highways) for Bureau of Public Roads.

MAINTENANCE SECTION

HIGHWAY MAINTENANCE

For the purpose of maintaining the surfaces of our State Highway System, including drainage facilities, shoulders and guard rails, each of the eight Districts of the State is divided, geographically, into working sections containing, as nearly as possible, ninety (90) lane miles of surface. Due consideration is given to other pertinent factors, such as isolated sections of State Highway, physical barriers etc., and necessary temporary adjustments made during the procedure of establishing the working sections.

Each maintenance section is staffed in accordance with a previously approved staffing formula within the limits of positions and personnel made available to the Department by others.

Maintenance consists of routine or physical maintenance work, and betterment work. Physical maintenance consists of maintaining the highway and its existing facilities or restoring it to its originally constructed condition, and includes surface treatments with liquid bitumens and cover aggregate, or as has been the case almost entirely for the last ten years, treatment by the application of bituminous concrete overlays of less than 3/4" in depth.

Betterments include improvements and additions to the originally constructed highway, such as drainage and guard rails, and includes overlays of 3/4" depth and over, which represent capital outlays.

MAINTENANCE SECTION

Physical maintenance and betterment projects are carried out both by using Department forces and by contract. As our lane mileage increases each year, because of our lack of sufficient personnel and in the interest of economy and allowable time, most of the major items of maintenance, either physical or betterments, are being performed under advertised contracts.

The substance of this report will deal primarily with a summary of major items of physical maintenance carried out by contract, and with betterment work carried out by contract, including Resurfacing Betterments.

PHYSICAL MAINTENANCE

Routine maintenance operations were carried out by Department Maintenance Forces, and included such operations as minor shoulder repairs, and certain shoulder or surface treatment with liquid bitumen and sand or stone cover.

A regular program is prepared annually to carry out surface treatments throughout the eight (8) Districts of the State by the application of Class I Bituminous Concrete Type S.T.

Paucity of funds allotted for contract maintenance work make it necessary to completely omit the S.T. Surface Treatment program for Fiscal 1969 in order to more nearly meet the needs of other units of maintenance which could not be eliminated.

Since the Department has no maintenance depot or personnel located on the Island of Nantucket, maintenance of the only State Highway (Siasconset Road) on this Island has been carried out by the Town of Nantucket under contract with the Department.

MAINTENANCE SECTION

Prior to Fiscal 1969, two (2) separate contracts were prepared to cover a calendar year owing to the different fiscal year endings of the State and the Town. As a result of discussions between officials of the Town of Nantucket and the Department, a contract was negotiated to cover maintenance of this State Highway for the full Department Fiscal Year from July 1, 1968 to June 30, 1969. The sum of \$9,400.00 was allotted for this work.

BETTERMENTS

Force Account

Ten (10) Force Account Betterments, located in Districts 2, 4 and 5, were approved to be carried out by District Maintenance Forces during the year at a total estimated cost of \$20,150.00. Work performed included new drainage installations, new guard rails, sidewalk preparation and installation of traffic safety islands.

Contract

Five (5) Betterment Projects, located in Districts 2, 4, 6 and 8 were carried out by contract during the year at a total cost of \$114,450.00, from Account No. 2940-37. Project work included sidewalk preparation and new drainage installations.

Funds allotted to Maintenance for this work during Fiscal 1969 were so limited that the entire amount was assigned to the highway unit for urgent projects.

RESURFACING

Although only \$2,000,000.00 was appropriated and allotted to the resurfacing account for Fiscal 1969, the fact that a supplementary appropriation of \$4,000,000.00 in the Fiscal 1968 Account was

MAINTENANCE SECTION

not available for use until May 1968 made it necessary to carry over a portion of these funds to Fiscal 1969.

Accordingly a total of 33 contracts were awarded during the year for the resurfacing of approximately ninety-three (93) miles of highways with Class I Bituminous Concrete Type I-1, varying in widths of from 24 feet to over 60 feet, and varying in depth from 1-1/4" to 2-1/2".

All funds were from Account No. 2940-33, and total cost was approximately \$4,500,000.00.

MISCELLANEOUS

Preparation of the report on "Quotation Prices per Ton for Bituminous Concrete Patching Mix Furnished and Loaded at Plant" was completed following the "Critical Path Method Chart" used for the past couple of years and with additional assistance by the computer section. This year, additional information was furnished the computer following which results were produced which rendered the resolution of the bids to be accomplished more logically than in other years.

Information relative to long range programs is presently being prepared which will be stored in the computer which can quickly furnish future programs of any size in the amount of, and in the proper sequence of priority of its various component projects.

It is again necessary to call attention to the fact that Maintenance appropriations are substantially inadequate to properly carry out needed maintenance and betterment operations if we are to keep pace with the constantly increasing mileage of our State Highway System owing largely to the construction of the Interstate System.

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Delay in obtaining funds for surface treatments at the time they are initially proposed frequently results in deterioration of the surface where resurfacing becomes necessary at a much greater expense. Likewise, assignment of funds near the end of a fiscal year frequently allows insufficient time for the preparation of contracts and completion of the work before the end of the fiscal year, at which time use of non-continuing accounts expire.

Therefore it is recommended that:

1. Provision be made for use of contract maintenance funds for some prescribed period beyond the end of a fiscal year in order to be able to award contracts to a point near the end of such year and have sufficient time to complete the work in the following year.
2. That appropriations for proper maintenance of our Highway System be made comensurate with the normal requirements for same.
3. That such steps as necessary be taken from time to time to encourage the Legislature to make provisions for the preceding recommendations.

MAINTENANCE SECTION

STRUCTURES MAINTENANCE

BRIDGES

As of July 1, 1969, the Department had maintenance responsibility for a total of 2,373 bridges, having a total work load area of approximately 2,328,000 square yards. This compares to 2,185 bridges and a work load area of 2,140,000 square yards maintained a year ago.

The Department shows maintenance responsibility on 115 bridges over various railroads which are included in the total.

The Department had Operation and Maintenance responsibility for twenty (20) Drawbridges located over navigable waters.

<u>LOCATION OF DRAWBRIDGES</u>	<u>OPENINGS DURING FISCAL 1969</u>
Amesbury-Deer Island Bridge over Merrimack River	118
Beverly-Salem, Route 1A over Danvers River	764
Beverly-Salem, Kernwood Avenue over Danvers River	842
Beverly Hall Whitaker Bridge over Bass River	9
Gloucester, at Blynman Canal Route 127 over Annisquam River	7932
Haverhill-Groveland, Route 97 over Merrimack River	23
Haverhill-West Newbury Rocks Bridge over Merrimack River	23
Newbury, Plum Island Turnpike over Plum Island River	174
Salisbury-Newburyport, Route 1 over Merrimack River	955
Braintree, Weymouth Landing, Route 3 over Monatiquot River	1
Fall River-Somerset, Brightman Street over Taunton River	944

MAINTENANCE SECTIONLOCATION OF DRAWBRIDGEOPENINGS DURING FISCAL 1969

Fall River-Somerset Slades Ferry over Taunton River	2699
New Bedford-Fairhaven, Route 6 over Acustnet River	2882
Quincy-Weymouth, Route 3A across Weymouth Fore River	530
Westport Point, Route 88 over Westport River	20
Sctiuate-Marshfield, Route 3A over North River	9
Tisbury-Oak Bluffs, Beach Road over Lagoon Pond on Martha's Vineyard Island	361
Boston-Milton, Granite Avenue Route 3 over Neponset River	664
Cambridge, Commercial Avenue over Leachmere Canal	104
Lynn-Saugus, Western Avenue over Saugus River	2203

TOTAL OF ALL OPENINGS 21,257

CONTRACT MAINTENANCE PROJECTS

Cleaning and Painting Bridges throughout the State (12 bridges under 9 contracts). Value: \$192,000.00

<u>CITY OR TOWN</u>	<u>LOCATION</u>	<u>WORK</u>	<u>COST</u>
Wareham-Bourne	Rte 6 and 28 over Cohasset Narrows	Gunitite work, pile work and general repairs	\$28,600.00
New Bedford- Fairhaven	Rte 6 over Acushnet River	Cleaing and grout- ing masonry at three bridges	27,800.00
Marshfield- Scituate	Rte 3A over North River	Timber Pile work	1,000.00
Acton, Biller- ica, Harvard- and and Chelms- ford	Various loca- tions	Gunitite repairs on 8 Bridges	20,100.00

MAINTENANCE SECTIONCONTRACT MAINTENANCE PROJECTS CONT'D.

<u>CITY OR TOWN</u>	<u>LOCATION</u>	<u>WORK</u>	<u>COST</u>
Attleboro, N. Attleboro, Foxboro and Sharon	All on Rte I-95 (11 bridges)	Installing ar- mored joints and related work	\$68,200.00
Andover, Haverhill, Lawrence, Methuen and N. Andover	On Rtes 495, 93 and 113 (18 bridges)	Reset and replace slope paving	28,140.00
Quincy-Weymouth	Rte 3A over Fore River	Drawbridge traffic gates repair	2,500.00
Tisbury-Oak Bluffs	Beach Road over Lagoon Pond	Operation and Maintenance of Drawbridge	3,000.00
Beverly-Salem	Approaches to Kernwood Avenue over Danvers River	New Guard Rail, drainage and R & R curbing	5,000.00

Inspection by divers of various bridges to determine the condition of substructures in the following districts:

Districts 5 and 8	8,500.00
Districts 6 and 7	5,200.00
District 2	7,000.00

Boston and vicinity State Highways Electrical Maintenance Service:	15,430.00
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Burlington	Rte 128 over Cambridge Street	Bridge Steel Repairs	5,300.00
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TOTAL \$417,770.00

CONTRACT BETTERMENT PROJECTS

<u>City or Town</u>	<u>Location</u>	<u>Work</u>	<u>Cost</u>
Raynham	Rte 44 over 24	Waterproof and Resurface	\$17,400.00
Dedham	Rte 1 at High St. and Williams St.	Major repairs, Waterproof and resurface and new armored joints	88,900.00
Easthampton	Rte 5 over Ox Bow, Conn. River	Installation of Galvanized bridge railing	29,600.00

MAINTENANCE SECTIONCONTRACT BETTERMENT PROJECTS CONT'D.

<u>City or Town</u>	<u>Location</u>	<u>Work</u>	<u>Cost</u>
Chesterfield	Rte 143 over Westfield River	Waterproof and Resurface	\$11,600.00
Greenfield- Montague	Main Street over Conn. River	Bleeders, Con- crete work, Waterproof and Resurface	30,400.00
Yarmouth-Dennis	Rte 28 over Bass River	Bleeders, Con- crete work and Waterproof and Resurface	47,300.00
Stow	Rte 62 over Assabet River	Waterproof and Resurface	10,000.00
TOTAL			\$235,200.00

EXPERIMENTAL PROJECTS

Experimental projects were carried out during the 1969 Fiscal Year using several different products.

A bridge deck overlay experimental project was carried out in District 6 on the Weymouth Middle Street bridge over the Southeast Expressway using five different products under the same conditions so that each product could be fairly evaluated. The products were as follows:

1. Rambond #223 - modified bisphenol epoxy with a polyamide curing agent manufactured by The Ramchem Company of Montpelier, Vermont.
2. Concessive #1064 - two component epoxy resin manufactured by Adhesive Engineering Company of Lawrence, Massachusetts.
3. Beta-Top #437.2 - epoxy-polysulfide blend manufactured by BFC Division, Essex Chemical Corp. of Sayreville, New Jersey.
4. Rub-R-Road Compound #526 - single component solution of uncured nitrile rubber and resins manufactured by Firestone Corporation distributed by Triram Corp. of Framingham, Mass.
5. PRC Deck Coating - two component polyurethane primer and a three component polyurethane base finish coat, third component is asbestos coated ground glass, manufactured by Products Research and Chemical Corporation of Gloucester City, New Jersey.

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EXPERIMENTAL PROJECTS CONT'D.

The test samples on the bridge are still under surveillance to determine their value.

Experimental work was also conducted with a new material for a joint sealer. The product was "Gardox" manufactured by W. R. Meadows, Inc. of Elgin, Illinois.

One experiment was conducted in District 7 on the Duxbury Route 3A bridge over the Southeast Expressway. The joint material was used in the finger type expansion joints and did not prove too successful. This experiment took place on July 11, 1968.

Gadrox is a liquid neoprene which is a two component material that comes in two viscosities. The lighter viscosity was used on the Duxbury project which may contribute somewhat to its failure along with the shear action of the finger type joints.

A heavy bodied Gardox was used in a straight joint on the Barnstable Route 6 bridge over Route 132. This joint was filled in October, 1968, with good adhesion still evident in June, 1969. As a result of this, three more joints were sand-blasted clean and filled with Gardox (heavy bodied) on the west bound bridge at the same location. The work was done by the District Bridge Crew in a period of about six hours. The ease of application and the reasonable price of the material makes this product attractive as a future joint sealer.

These joints will be under surveillance to determine adhering quality and elasticity of the material.

All experimental work is conducted in cooperation with the Research and Materials Division.

MASSACHUSETTS CIVIL DEFENSE AGENCY ENGINEERING SERVICE(DPW)ACTIVITIES

1. DPW Maintenance personnel participated in a Federal Regional I Training Program in Emergency Highway Traffic Regulation. The course consisted of 32 hours of training in Emergency Highway Traffic Regulation-oriented subjects and a test exercise. The training team was made up of the Bureau of Public Roads, the National Highway Users Conference and the International Association of Chiefs of Police.

The aim of the course was to train several representatives of each of the State highway departments, State Police organizations, highway users groups, State Civil Defense organizations, and appropriate military liaisons in each region on Emergency Highway Traffic Regulations so that they, in turn, can train additional representatives of each organization in their respective states.

MAINTENANCE SECTION

MASSACHUSETTS CIVIL DEFENSE CONT'D.

The DPW Civil Defense Staff is now in the process of developing a 16 hour EHTR training course for State DPW personnel which will be conducted in the fall.

The Massachusetts DPW will be responsible for training of Public Works representatives at the local government level once the program has been initiated.

2. Participated in meetings between the Massachusetts DPW and the construction industry as represented by members of the New England Road Builders Association and the Associated General Contractors of Massachusetts for the purpose of implementing "Plan Bulldozer" in Massachusetts. The plan has been designed to enable the construction industry to carry out its emergency functions most efficiently in a disaster.
3. Assisted in the coordination of the transfer of 4-800 g.p.m. and 4-1500 g.p.m. - wheel mounted-heavy duty Civil Defense Agency portable water pumps to the DPW for the utilization, storage and maintenance by the Department.
4. Participated in a Federal OCD sponsored program whereby the Systems Development Corporation has been contracted to assist the City of Worcester-Civil Defense organization in developing the Public Works Annex to the City Emergency Plan. Portions of the Worcester Plan might be tailored for the DPW-Public Works Annex to the State Plan.
5. Revised the Massachusetts DPW-CD Plan now in existence. The plan has been up-dated to keep trend with the Emergency Planning concepts of the Office of Emergency Preparedness and the Department of Defense.
6. Arranged the exchange of all radiological instruments assigned to the State DPW for new and modified equipment provided by the State Civil Defense Calibration Lab.

MAINTENANCE SECTION

TRAFFIC MAINTENANCE

Because of limited funds, only one of the local area conferences was attended this year. However, this was the Highway Research Board Meeting in Washington in January, at which the Traffic Maintenance Field Engineer for Signs was invited to present a paper on Sign Preventive Maintenance. Since this Department, although handicapped for lack of adequate man-power and equipment, seems to have accomplished more pioneering in one or two phases in this field than most of the other states represented at the conference, the paper was very well received. Many states have requested copies of the paper and one public works magazine asked, and received, permission to reprint the paper in one issue. This presentation also brought to the Department future representation on the Maintenance Operations & Safety Committee of the Highway Research Board.

Not only does the Traffic Maintenance Unit suffer from a lack of adequate man-power and equipment but also because funds are not made available when they are needed. This year several of the M & B paint machines were laid up for months because funds were not released to make repairs to put the machines back into production.

Contractors were late last fall in repainting many State Highways because allotments were not made available until long after they should have been. These are but two examples of serious delays caused by late appropriations, especially for conducting seasonal operations.

It is being recommended that each Traffic Maintenance Section be staffed with a Working Foreman-Spray Painter and a Painter on a permanent yearly basis. Working foremen are needed to work with and

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direct personnel on other operations such as sign maintenance, signal installation, etc.

This year four sign cleaning machines were purchased. They were delivered after the Traffic Line painting season had started and, because of a lack of man-power, all other operations are suspended in order to complete the Traffic Lines during the painting season.

Toward the end of the year, a "Hot Paint" machine was purchased. This will not be delivered until late this fall, but it is a much needed machine and one that has taken three years to purchase. During Fiscal 1969 several of the older paint machines that were continually breaking down were traded. The next needed action for Safety Line Painting is the trading of the M & B (an intermediate size paint machine carried on a trailer) machines, that have become a constant maintenance problem, for hot paint machines. Hopefully, some will be traded in 1970 and the rest in 1971.

To perform adequate sign maintenance, new equipment is necessary which will take several years to procure.

Progress has been made in procuring, for the signal electricians, some equipment which will enable them to reach the mast arm installations as well as the presently mounted safety lights. Currently, the Department is considering tower lighting and also individual poles with the safety light 45 feet and higher. Equipment to reach these installations will require many years in purchasing.

New and more efficient methods, changes in design and new and better materials all necessitate the need of additional and new equipment now, not years from now, which should be sufficient justification for increasing the equipment budget rather than reducing each

MAINTENANCE SECTION

year's request and struggling with antiquated equipment that results in excessive machinery maintenance costs.

There was close cooperation, as in other years, with Research and Materials in experimenting and developing of better materials. Several traffic paints were procured this year and test lines were installed by Maintenance and evaluated by Research and Materials. As a result, small quantities of seven different paints, some of which were Research and Materials own formulation, were applied late in the year and will be closely watched. Two types of beads, new to the Department, have been purchased in small quantities and will be used and evaluated. Hopefully a contract will be awarded in 1970 for a pavement marking material never before used by this Department, and it will be guaranteed for two years that will be the equivalent of twelve needed paintings on some of our heavily traveled roads.

Reflective sheeting from new manufacturers has been tried. Should it meet our requirements, the price will decrease as, up until now, there has been only one manufacturer in the field.

Painted backgrounds vs reflective backgrounds on guide signs is another experiment. Painted background signs are far less costly, both initially and to maintain.

For years, on almost all construction contracts, the Maintenance Division has had the task of installing, maintaining and subsequent removal of all signs needed during construction. This year Maintenance succeeded in having most of this work incorporated in the proposal. This will result in a tremendous labor saving and free our traffic crews for much needed maintenance operations. It also saves maintenance money for other maintenance operations.

MAINTENANCE SECTION

For our own contract maintenance work we developed a specification and special provision, which is incorporated into the contract proposal thus releasing the traffic unit for other traffic maintenance work.

SIGN MAINTENANCE

As in the past, this is a unique operation. It suffers, understandably, for want of sufficient man-power to carry on a routine preventive maintenance program in each District year after year. Programmed preventive sign maintenance should be performed during the same season when the highways must be painted. Sign deterioration and the deterioration of the sign supports is slow and not too noticeable so, most of the time, it goes well beyond the preventive maintenance stage and the sign must be completely be replaced.

The current man-power situation is such that the Department has encountered difficulty in keeping up with emergency replacements and routine sign erections (additional and new signs). Even with adequate staffing, little could be done to the overhead and large ground mounts without suitably designed equipment to handle this kind of an operation.

The present solution is contract sign maintenance. However, the money allotted for this is far less than what is needed, i.e., \$50,000.00 allotted for 1970 as against an estimate of \$330,000.00 and a total of \$572,000.00 for 1970-71-72. This results in the Department falling farther and farther behind in preventive sign maintenance.

The Department has been able to do a little force account work and, also, to award and complete two contracts. From this limited experience with force account and contract work, it is opined that, with proper equipment, force account work should cost about one third

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the cost of contract work. Since it will be many years before the Department has sufficient employees and equipment to properly perform Force Account work, contract maintenance will be a necessary expensive operation that must be done.

Limited funds were made available this year for contract sign maintenance. Two contracts were awarded and completed at a cost of \$77,000.00. These were for sign panel and sign support refurbishment on a section of 495 in District Four and a section of 128 in District Five. The results were rewarding. On one project the contractor developed an equipment innovation that should be a time saver on future contract or force account work.

As always, delineation is the most troublesome, the most costly and the most frustrating of all traffic maintenance operations. Theft and vandalism have been reduced, but not eliminated, through the use of a rivet and locking collar which this Department was among the first to adopt and use. If all available traffic maintenance employees did nothing but restore missing delineators and install new ones on highways where no delineators now exist, as the Federal Bureau recommends, they could not begin to keep up with the thieves, vandals, careless snow plow operators and mowing machine operators. Delineators installed today are gone tomorrow. From 60,000 to 70,000 delineators are either replaced or installed a year and all we do is go farther and farther behind. To cope with snow plows and mowers, there is needed a post that will yield on impact and rebound to its original position. Manufacturers have been sounded out on such a post and, doubtlessly, some day there will be a post of this type perfected.

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Additional progress was made in sign refurbishment, but much less than should have been done. Last year it was mentioned that 1/4" high density plywood, applied over the original sign either in the field or in the shop, was the best material to use. This year 5/8" was used with better results. Using this method, almost all of the older Rest Area signs were refurbished and, at the same time, brought into conformance with current Bureau standards, i.e., from a reflectorized cream background with green painted letters, to a blue reflectorized background with white reflectorized letters. This work could not have been done without the cooperation of skilled personnel from the Sign Shop in Wellesley working with District personnel.

Last year's report mentioned the use of a new small square telescopic sign post. This Department pioneered this post as a breakaway post and, as a result of our work, the Bureau has now approved this post for use as a breakaway post on Interstate work.

Another neglected operation has been sign cleaning. Toward the close of this year four sign washers were delivered, one for every two Districts. Hopefully, next year progress can be reported in this field.

This year there was much improvement in making available money with which to purchase many special tools and equipment. Each District received a portable power hack saw (about \$250.00 each), which should pay for themselves in one year in labor cost savings in making up sign assemblies and replacing sign posts in the field damaged by vandals and motorists. Sign post accessories, such as

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drive caps and brackets have been set up as stock items which now allows quantity purchase with resultant savings. Torque wrenches were purchased. These are most essential in order to properly install or replace a large breakaway sign support. Without the right torque, the breakaway becomes just a post, thus increasing tremendously the possibility of fatal injury to the operator and passengers in the colliding vehicle.

For more efficient and less costly sign support installation and replacement, each District requires at least one completely equipped small panel truck with a generator, compressor, jack hammer, bull point, power driver unit, ladders and miscellaneous small tools used for this type of operation. This may not be a reality for some time because of budget limitations.

SAFETY LINE PAINTING

This year an increase of funds enabled the Department to apply 9,500 miles of paint, of which 1,125 miles were by contract. 25 of these miles were thermoplastic and 1,100 hot paint. As in the previous year, between the contract work and force account, all major highways had received their first painting by the first or middle of June. This was most pleasing to the motorist and cut criticism to a minimum. Over the year more miles should have been and would have been painted if the worn out M & B machines had not been continually breaking down. Unfortunately, when they do break down, it is months before they are back on the road because funds are never available when they should be for repairs. During the paint season there is never a day that somewhere at least one machine and, most

MAINTENANCE SECTION

of the time, two are out of production waiting for some one to release some money so they can be repaired. These machines should be traded for hot paint machines immediately, but it will be years before all are gone.

Last year it was mentioned that hot paint was more durable than cold paint. Further use of this paint now indicates it is no more durable than our current cold paint. However, as a safety material, it is more to be preferred than cold paint. As mentioned last year, it cures so fast no line protection is necessary. Hence, no workman is exposed to a careless driver as he sits and picks up traffic cones. No more does the motorist become irate as traffic becomes congested and he cannot drive at a high speed down the highway. No cones knocked all over the road, smashed or stolen. No paint tracked all over the highway.

In conjunction with Research and Materials, a proposal for crosswalks and stop lines was awarded in which three different materials were used. To date it would seem that one is not desirable, one is good and one could be better.

This year thermoplastic was incorporated into the resurfacing contracts so, on almost all resurfaced sections of all State Highways, there is now thermoplastic lane lines.

SIGNALS AND SAFETY LIGHTING

The updating of the Traffic Signals to bring them into compliance with the Federal Standards was deliberately slowed down this year as it was last year because of the inflated prices due to factories not being able to keep up with the demand, Country-Wide, for signal components and, State-Wide, a lack of contractors doing this kind of construction. It is disheartening to note that the first 70 signals rebuilt averaged \$4,085.00 per signal. The next 55 - \$5,525.00 per

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signal and the next 19 - \$8,500 per signal. To date 144 signals (only 25 this year) have been reconstructed at an average cost of \$5,225 per signal.

Bid prices will increase because new installations will be mushrooming everywhere due to the Federal Government "TOPICS" program and the Commonwealth's program, Chapter 519, whereby the state taxpayer reimburses 75% of the cost to the local community for the signal installation. With this vast area of work to choose from, contractors will not be too anxious to bid state work when they know specifications are rigidly enforced by the Department.

This year only 8 new signals were installed. This is a result of the Department keeping installations to a minimum because of the high prices.

Signal maintenance was about the same as in previous years. There was some improvement in that there was not as many emergency calls on account of controller failure. This is because almost all of the 144 reconstructed signals have new and solid state controllers. As signals are rebuilt and the old worn out controllers are replaced the emergency calls will continue to drop off releasing the electricians for normal routine preventive maintenance.

Safety Lighting maintenance is slowly deteriorating despite vigorous efforts by the Districts. It is very difficult and almost impossible to keep all the safety light standards painted, glassware washed and luminaires relamped without proper equipment and skilled men. In 1970 additional equipment will be available for reaching the luminaires (also mast arms at signal installations) so the present installations should receive more attention than in the past. However, the proposed plans for lighting on I-95 and 128 to Boston indicate our present equipment will not reach the new mounting heights of the luminaires.

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ROADSIDE MAINTENANCE

Activities carried on under the Maintenance Section Roadside Development Unit during Fiscal 1969 consisted of Contract Tree Planting, Mist Blower Spraying, Hydraulic Soil Sterilant and Custom Spraying, Mowing of Grass, Removal of Trees and Stumps and Travel Trash Collection, Normal Force Account Roadside Maintenance activities, such as Brush Control for Safe Sight Distance, Vista Clearing, Selective Clearing and Trimming, Rest Area and Truck Turn-out Improvement and Maintenance, Drainage Ditch clearance, Emergency Tree Removal and Trimming along with Litter Pickup, were carried on in all Districts.

The Co-operative Research Program, sponsored jointly by the Massachusetts Department of Public Works, Bureau of Public Roads and the University of Massachusetts, Department of Plant and Soil Sciences of the College of Agriculture is showing progress. Various experimental slope plantings of Evergreen Seedlings, Crown Vetch and Sweetfern have been made in all Districts, using plant material grown at the University and collected sods and rhizomes of Sweetfern to solve our problems of soil erosion and expensive mowing requirements. With the use of growth chambers, the personnel of this program is working on methods to artificially break the dormancy of seeds, thereby reducing the cost of plant materials to be used on our slopes.

The Highway Landscape Supervisor, in the capacity of Technical Advisor to the Research Program, is able to direct efforts in the field of combating erosion through planting material in the various

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environments of the State. He is also representative of the Commissioner on the State Pesticide Board and in this position has access to first hand knowledge of desirable and undesirable chemicals used in destruction of harmful insects, weed control and soil sterilization along with instructions in their safe usage.

Budgetary assignments were insufficient to provide programs in Roadside Chemical Spray and Fertilization and Plant Fertilization. Both are desirable programs in Roadside Maintenance. The Roadside Chemical Spray and Fertilization eliminates succulent weed growth in grassed areas and strengthens grass root growth to combat erosion. Elimination of weed growth keeps necessity for mowing at a minimum. Plant Fertilization Spray is done to protect our multimillion dollar investment in Roadside Plantings, induction of Natural Growth and improve deteriorating areas. Healthy Roadside Growth is a deterrent against soil erosion.

Tree trimming is generally considered to be winter work for companies involved in this type of work. Money for tree trimming became available in the late spring and work was advertised in all Districts. Four Proposals drew no bidders, seven proposals had but one bidder and three proposals had two bidders. The bid prices were so much higher than the Office Estimate that all bids were rejected. In Fiscal Year 1970 only \$100,000.00 has been made available for Tree Trimming. It is estimated that this will allow us to accomplish seven out of fourteen needed contracts. Reports from Districts brought to light that winter storms caused damage estimated at \$300,000.00 over and above the normal State-Wide Tree Trimming requirements.

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Overtime payment for removal of dangerous branches, felled by storm, would nearly pay the cost of an annual Tree Trimming program.

Work in the other roadside responsibility of the Maintenance Section is listed as follows:

TREE PLANTING

3751 hardwood, shade, evergreen and flowering trees and shrubs, along with 46,050 evergreen seedlings were planted on various State Highways under 8 contracts. Many shade trees, 14-16 ft. in height, were planted in Roadside Rest Areas to provide shade for the motoring public in areas that previously were treeless. The evergreen seedling planting is part of our relentless struggle to control erosion and to reduce mowing areas.

<u>DISTRICT</u>	<u>TREES & SHRUBS</u>	<u>SEEDLINGS</u>	<u>ALLOTMENTS</u>
1	80	4500	\$15,825.00
2	632	2000	12,402.00
3	123	2500	8,614.00
4	566	5000	28,848.50
5	753	5300	13,295.00
6	537	23875	28,710.25
7	252	2875	7,038.50
8	<u>808</u>	<u> </u>	<u>11,500.00</u>
	3751	46,050	\$126,233.25

MIST BLOWER SPRAY FOR SUPPRESSION OF DUTCH ELM DISEASE

This work was accomplished on a State-Wide basis under eight (8) individual contracts at a cost of \$44,593.00. Spraying for suppression of Dutch Elm Disease is a mandate of the laws.

MAINTENANCE SECTIONHYDRAULIC SOIL STERILANT AND CUSTOM SPRAYING

The work under this item was accomplished in three separate phases:

1. Hydraulic Spraying with Diuron along and under guard rail to kill obnoxious weed growth and keep the Guard Rail visible at all times.
2. Spray with 2,4-D+2,4,5-T to eliminate undesirable growth in maintenance of sight distance.
3. Custom hydraulic spraying with Diuron of grass and weed growth along curbings, sidewalks, walls, bridge abutments and other hard to reach areas.

This program was carried out under 8 contracts at a cost of \$58,577.70.

MOWING OF GRASS ALONG STATE HIGHWAYS

In an attempt to have tighter control over mowing operations, the work was broken down into 93 contracts, one for each Repair Section with the Repair Foreman responsible for Mowing in his Section. There seems to be a definite improvement in the quality of the work under this system. The ever-increasing area of roadsides requiring Mowing forebodes higher costs which can only be reduced or minimized by a positive program of mulching and planting for the dual purpose of erosion control and cost reduction.

The work was accomplished under ninety-three (93) contracts along 2,558 miles of highway at a cost of \$580,000.00 for the 1969 Fiscal Year. On the calendar year basis (1969) the cost was \$673,000.00.

<u>DISTRICT</u>	<u>NO. OF CONTRACTS</u>	<u>MILES</u>	<u>COST</u>
1	7	269.9	
2	11	357.9	
3	14	414.5	
4	15	326.1	
5	11	246.0	

MAINTENANCE SECTION

<u>DISTRICT</u>	<u>NO. OF CONTRACTS</u>	<u>MILES</u>	<u>COSTS</u>
6	17	409.5	
7	15	467.8	
8	<u>3</u>	<u>48.7</u>	
TOTAL	93	2,558.4	\$580,000.00 (Combination of 1968 and 1969 Funds)

REMOVAL OF TREES AND STUMPS

Dead, diseased and dangerous trees are removed in the interest of highway safety and to promote health in existing desirable roadside growth. This work was accomplished on a State-Wide basis for removal of 4,047 trees under 15 contracts.

<u>DISTRICT</u>	<u>NO. OF CONTRACTS</u>	<u>TREES REMOVED</u>	<u>ASSIGNMENTS</u>
1	2	709	\$47,810.00
2	2	583	51,213.00
3	3	634	39,224.00
4	3	860	46,501.00
5	1	292	13,219.00
6	2	507	31,339.00
7	1	360	19,992.00
8	<u>-1</u>	<u>102</u>	<u>3,233.00</u>
TOTALS	15	4,047	\$252,531.00

TRAVEL TRASH COLLECTION

Thirteen contracts were awarded for the collection and disposal of travel trash along 467 miles of State Highway. Ten contracts call for the emptying of a total of 915 Department-owned travel trash barrels for an average of 85 pickups and three contracts required the contractor to furnish 54 containers, serviced by packer type disposal

MAINTENANCE SECTION

trucks an average of 60 times per season between May 31 and October 31. The cost of \$39,125.00 (\$28,100.00 - 1968 funds, \$11,025.00 - 1969 funds) is much less than would be the cost of doing this work with Department personnel and equipment.

PREVENTIVE ROADSIDE MAINTENANCE

With each mile of new highway being accepted by the Department, the acreage of roadsides increases by about twenty-seven acres, most of which, on slopes is seeded to grass. The master plan for developing preventive maintenance into over 40,000 acres of land that abuts the 2,700 miles of State Highway, which was originated several years ago, is still being pursued through the mulching and planting of many areas, State-Wide, with over 30 species of hardy seedlings, shrubs, ground cover, natural growth sods and trees, contingent upon the availability of funds. When the ecology is right, natural growth is induced to fill in the planted area to present naturalistic roadsides.

Our planting is to effect economy in Highway Maintenance. Grassy areas requiring several mowings annually are being transformed into naturalistic roadsides with built-in erosion control.

Attractive roadsides will encourage greater numbers of tourists who uplift our State's economy through the expenditure of over a billion dollars annually.

previously recommended Programs that are urgently needed.

Selective Clearing and Brush Removal for Sight Distance.

No funds were provided to accomplish this work which is directed to highway safety by opening sight distance and exposing background views to the motorist. It is recommended that this work be pursued.

DITCH CLEARANCE

Obstructions to flow in Drainage Ditches contribute to soil

erosion along our highways and inefficient flow of drainage system discharge. This year, District forces will spray vegetation existing in ditches. Current obstructions in ditches should be cleared away under contract as our 1400 miles of ditches will be too much to ask our already undermanned personnel to attempt along with their other necessary duties.

Construction of Roadside Rest Areas

Modernization of existing rest areas and the critical need of construction of new facilities is considered essential in promotion of travel. Many of our existing Rest Areas are currently being used beyond a practical capacity.

Certain locations, State-wide, were selected for Roadside Rest Area Construction under President Johnson's Beautification. It is apparent that no funds will be forthcoming under this program and other arrangements must be made to provide these critically needed areas as soon as possible.

Recent field observations indicate that we do not have a sufficient number of Rest Areas on some Routes. The existing facilities are being put to near capacity use by drivers of both passenger cars and trucks. Week end observations noted double the usage and a definite lack of sufficient facilities.

Land values are rising rapidly, particularly near new expressways. Further delay in obtaining land and designing areas will make for high cost in future construction. Action should be taken now.

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SNOW AND ICE CONTROL

Snow removal on State Highways is carried out under authority of Section 19, Chapter 81, of the General Laws as amended.

During the 1969 Fiscal Year the Department plowed and treated with spread chemicals 9008 lane miles of State Highway.

Snow removal on Town roads is carried out under the authority of Section 11, Chapter 83, of the General Laws. During the year, the Department cooperated on plowing 486 linear miles of Town highways. Under the Act, the highways selected were plowed in cooperation with the Town with 50% of the cost being borne by local agencies.

Snow and Ice Control, in addition to plowing snow and spreading sand and chemicals on the pavement, consists of erecting snow fence to break the velocity of the wind, thereby preventing snow drifting onto the highways; the clearing of waterways to enhance the run-off of melting snow; alert patrolling of the highways; removing snow from bridges; loading and hauling snow from certain structures and areas where it cannot be winged back from the travelled way, and the clearing of signs and signals.

The 1968 report describes the Department's venture in purchasing a pre-mixed sodium and calcium chloride blend for use in snow and ice control. This blend is much superior to that which Department forces can produce. The new material was so well received throughout the State, because of its capability to do the job, that the Department increased the tonnage to 24,000 in 1969 and, at this writing, has signed a contract with Chemical Corporation of Springfield, Mass.

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for the delivery of 36,000 tons for Fiscal 1970. The experience gained in the materials handling is reflected in the bid price even though there has been an increase in the price of materials. The cost of both sodium and calcium chloride has increased one dollar (\$1.00) per ton, plus a freight increase of thirty cents (\$0.30) per ton.

Massachusetts was the first state to successfully coordinate such an undertaking, and now, the year 1970 finds the States of New Jersey, Pennsylvania, Ohio, Maine and Vermont venturing into the field of pre-mixed chemicals.

The following tables list the amount of material used for the Fiscal Years 1961 through 1969.

QUANTITY OF MATERIALS IN TONS

<u>YEAR</u>	<u>LANE MILES</u>	<u>SAND</u>	<u>SODIUM</u>	<u>CALCIUM</u>	<u>PRE-MIX SODIUM-CALCIUM</u>
1961	7,258	237,900	67,000	4,940	-
1962	7,538	310,800	79,080	4,230	-
1963	7,884	327,900	85,610	4,870	-
1964	8,280	326,370	99,030	4,980	-
1965	8,460	300,136	113,657	4,550	-
1966	8,640	250,212	120,300	5,855	-
1967	8,650	273,685	136,727	5,704	-
1968	8,851	214,734	112,429	2,665	15,000
1969	9,008	168,355	145,694	1,531	24,000

Snow and Ice Control costs have been increasing each year due to the following reasons:

1. Added lane miles of completed construction on the Massachusetts Interstate Highway System. This is the largest contributing factor,

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2. Increased labor costs, which in turn are reflected in the material and freight costs.

Thirty-five (35) Highway Cleaning contracts were awarded by the Department for the cleaning of winter sand from State Highways. Four hundred and forty-two (442) linear miles of highway, mostly major routes, were cleaned at an average cost of one thousand dollars and thirty seven cents (\$1,000.37) per lineal mile.

Thirty-six (36) Catch Basin Cleaning contracts were awarded by the Department for the cleaning of 52,695 catch basins at an average cost of two dollars and ninety cents (\$2.90) per basin.

Highway Cleaning - 35 Proposals

442 Linear miles	Actual Bids and Funding	\$442,553.50
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Catch Basin Cleaning - 36 Proposals

52,695 Catch Basins -	Actual Bids and Funding	\$152,343.50
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The average snowfall for the entire State was 81.7 inches.

In responsible pursuit of "Acquisition and Improvement of Maintenance Sites" (2940-30) there was expended \$57,187.70 for:

The construction of Salt Sheds

One shed in each District -

8 sheds in all at an approximate cost of \$5,600.00 ea.	\$44,800.00
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1 Chain Link Fence - Stoughton	9,413.00
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One Water Service - Uxbridge	374.70
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Gravel - for Haverhill & Reading	2,600.00
	<hr/> \$57,187.70

MAINTENANCE SECTION

EQUIPMENT

The following Equipment was purchased in the 1969 Fiscal Year:

12	--	Generators
12	-	Pumps
36	-	Pickup Trucks
80	-	Snow Plows
17	-	Sweepers
5	-	Tow Behind Sweepers
8	-	Rollers
7	-	Compressors
4	-	Sign Cleaning Machines
12	-	Front End Loaders
18	-	Tar Kettles
31	-	Walk Behind Tractors
13	-	Concrete Mixers
2	-	Paint Shakers
1	-	Concrete Saw
25	-	Chain Saws
48	-	Sander Bodies for Dump Trucks
49	-	Dump Trucks
2	-	Tower Trucks
18	-	Stake and Racks
3	-	Platform Lift Trucks
8	-	300 Gallon Spray Tanks
24	-	Snow Units
1	-	Pavement Marking Machine
6	-	Curbing Machines
3	-	Aerial Bucket Trucks
31	-	Mobile Radios

MAINTENANCE SECTION

The Equipment Unit has set up charts and a budget showing equipment to be traded and new additional equipment needed for the coming Fiscal Year.

The Equipment Unit also set up to purchase a new Base Station and Micro Wave in Boston and at Mount Wachusetts.

MAINTENANCE SECTION

TWO-WAY RADIO COMMUNICATIONS

The Department's Two-Way Radio Communication Network licensed by the Federal Communications Commission and operated and maintained by Maintenance personnel in accordance with the provisions of Part 89 of the Commission's Rules, regulating conduct of the Highway Maintenance Radio Service, continued to provide an efficient means of communications during the routine and emergency activities of the Department during the year.

At the present time the network consists of the following units:

MAINTENANCE SECTION

- A. 1 Monitor Control Station
- B. 10 District Base Stations
- C. 4 Microwave Links with Related Terminals
- D. 8 Auxiliary Base Stations
- E. 6 Auxiliary Civil Defense Stations
- F. 2 Emergency Portable Stations
- G. 344 Mobile Stations in Cars and Trucks
- H. 14 Citizen's Band Portables and related "Walkie Talkies"

During the Fiscal Year an examination was made of existing equipment and procedures were undertaken to develop a program of data processing pertaining to allocation, use and operating condition of Department mobile radio units, in order to eliminate manual posting details and to establish better replacement and inventory controls.

MAINTENANCE SECTION

Upon recommendation of communications personnel of the Department and under the supervision of the Maintenance Engineer the program of preventive maintenance applicable to fixed radio installations was continued and a program of replacement of base and mobile units was implemented whereby compact transistorized equipment will replace tubed dual unit mobiles and solid state equipment will replace tubed base station equipment as far as budgetary limitations will permit. There is every indication that savings in material and labor will offset initial costs.

A final "phase out" date of the old equipment has been set as Fiscal 1975 but there is every indication that it can be accomplished before that time as firm arrangements now exist for an improved micro-wave base station installation at the new District Six Office and the microwave control and terminal Stations connecting the State wide monitoring and message facility at Boston and Mount Wachusett has been replaced. Bids were solicited and award made to the low bidder for 47 fifty watt mobile replacements. Plans have also been made to provide new mobile equipment for new positions which will be necessary under the expanded highway program.

In furtherance of the Department's Highway Safety Program this unit provided communications for and assisted in arranging for operation of twenty-two Holiday Highway Motorist's Aid Patrols on limited access highways in Districts 4, 5, 6, 7 and 8 during peak traffic periods on the long Holiday week-ends of Memorial Day, Independence Day and Labor Day. Because of the Statutory change in the celebration of Memorial Day in Massachusetts this year, additional patrols were authorized to operate on a limited basis in order to coincide with the flow of out of State traffic due to the celebration of

MAINTENANCE SECTION

Memorial Day on May 30th in the adjoining States.

The purpose of the operation was to relieve Police for enforcement duties by performance of routine and emergency highway maintenance functions.

These operations were successful and appear to have been well received by the traveling public as indicated by favorable comments in Metropolitan and Suburban news media.

Under the direction of the Maintenance Engineer and in coordination with the Snow and Ice Control Engineer and his staff, revisions were made by this unit in the S.O.P. for the Department's Storm Emergency Center operations as they pertained to communications.

Upon recommendations of the communications unit, certain additional telephone and teletype equipment was installed in the Center, including "Hot Line" connections with City of Boston Public Works and the M.D.C. Police. Card dial telephones were added which have greatly improved routine and emergency communication procedures.

In compliance with the requirements of the Federal Communications Commission, schedules and tabulation sheets were prepared and vehicle movements were coordinated in the conduct of the annual frequency measurements on mobile radio units. Arrangements were also made for measurements on Department base stations.

Research was conducted in preparation for publication of a new Directory of Mobile Units and Basic Signal Code to be used as a guideline for Base and Mobile Operators in the transmission of

MAINTENANCE SECTION

concise communications. Study kits were also prepared for use by Civil Service in the administration of Communications Examinations.

Data was collated and specifications prepared for procurement of urgently needed test equipment necessary to insure operations within the frequency tolerance permissible by the F.C.C. and adapted to transistorized circuit use.

Assistance was provided in the preparation of radio maintenance and repair contracts in order to insure uninterrupted communications to the Districts by assuring the services of a reputable contractor in each District in accordance with the provisions of Chapter 29, Section 8A of the Massachusetts General Laws.

Radio Maintenance personnel continued to perform preventive maintenance and emergency repairs on Department radio equipment with priority being given to base station operations. "Outs" and operating costs were thereby kept to a reasonable minimum.

In accordance with Legislative Mandate and Department Policy the two-way radio network of this Department was coordinated with the State and Federal Civil Defense Agencies. At the State level representation was provided for attendance at all meetings of the Massachusetts Emergency Economic Controls Commission with membership on the Communications Commission by duly authorized Maintenance communications personnel.

The Department's Auxiliary Civil Defense Network consists of

MAINTENANCE SECTION

Base Stations licensed to operate on Department Frequencies and located as follows:

- | | |
|------------------|-----------------------------|
| 1. State Control | Framingham |
| 2. Area | 1 - Tewksbury |
| 3. Area | 2 - Bridgewater |
| 4. Area | 2 - (Sector 2C) West Dennis |
| 5. Area | 3 Westborough |
| 6. Area | 4 Belchertown |

Mobile operations are conducted by use of the State-Wide Network authorized in the Department's license for the Call Sign KA - 8171 and there is a mobile station for this Department in the Civil Defense Mobile Station van.

The emergency communications net, which was established to provide a liaison apparatus with the United States Bureau of Public Roads and related Federal Agencies in the Boston area for the relay of Federal Defense Conditions messages continued to be maintained on a standby basis.

One additional Bureau of Public Roads vehicle was approved by this Department and authorized by the Federal Communications Commission for operation on our frequency, making a total of three units. Operation of these vehicles is restricted to emergency communications.

During the first half of Fiscal 1969 the Department continued to provide radio maintenance service for the Division of Beaches radio network. The Department has been relieved of these duties by Legislative Act and the Beach network is now the responsibility of the Department of Natural Resources.

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In accordance with a request from the American Association of State Highway Officials, the Deputy Chief Engineer for Highway Maintenance agreed to serve as Member for Massachusetts on the AASHO Subcommittee on Communications, whose function is to coordinate applications for frequency allocations in the Highway Maintenance Radio Service and local Government Radio Service with the Federal Communications Commission and other Public Safety Radio Service Committees and users.

While the function of the indicated Subcommittee is advisory and does not bind the Commission or the applicant, the Commission states in its Rules and Regulations that, in its absence, proof of notification and concurrence to all co-channel and adjacent frequency users within a radius of 75 miles or a costly engineering survey must be provided with the application. In the course of the fiscal year 112 applicants availed themselves of this Public Service and were issued letters of comment and recommendation.

MAINTENANCE SECTION

REGULATORY PERMIT

July 1, 1968 ----- July 1, 1969

During the year the following permits were issued by the Boston Office:

	<u>No. of Permits</u>
Heavy Equipment, House Trailers and Buildings	17,960
Driveways	135
Utilities	<u>545</u>
Total	18,640

During fiscal year 1969, 5,600 permits have been issued via telegram.

MAINTENANCE SECTION

CONFERENCES AND MEETINGS

During Fiscal Year 1969 ten conferences were held under the chairmanship of James F. Kelley, Maintenance Engineer.

Four conferences were on general maintenance and one each on Structures, Highways, Equipment, Roadsides and Traffic. A Snow and Ice Control School was conducted in each District.

All District Highway Engineers, District Maintenance Engineers, Assistant District Maintenance Engineers and their respective unit assistants were present and/or represented at these conferences. The purpose of said conferences was to discuss various maintenance policies, review problems in the field and reaffirm uniformity of operations.

In addition to the regularly scheduled conferences, Mr. Kelley conducted a meeting, in two sessions, for the purpose of coordinating the activities of the various units within the Maintenance Section and, also, to familiarize each unit with the latest methods, materials and equipment of every other unit.

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DIVISION OF WATERWAYS

The functions and duties of the Division of Waterways consist of the preparation of plans, and the undertaking of shore protection, harbor development, stream clearance and flood control work. The Division is the coordinating agency on Federal harbor development and flood control projects; it has charge of great ponds, public rights in certain streams, Commonwealth tidelands, rights in lands, flats, shores and tidewaters and must ascertain, as far as practicable, the location, extent and description of such lands; investigate the title of the Commonwealth thereto; ascertain what parts thereof have been granted by the Commonwealth; the conditions, if any, on which such grants were made, and whether such conditions have been complied with; what portions have been encroached or trespassed on and the rights and remedies of the Commonwealth relative thereto; prevent further encroachments and trespasses; ascertain what portions of said lands may be leased, sold or improved with benefit to the Commonwealth and without injury to navigation or to the rights of riparian owners.

Upon application, it issues licenses for structures in certain rivers, tidewaters and great ponds and permits for dredging and other activities on the land and waters under its jurisdiction, providing such are in the best interest of the Commonwealth. It furnishes hydraulic data to the Highway Division for use in drainage and bridge design and maintains and operates certain State lands, public beaches and State piers.

Authority for the above may be found in the provisions of Chapter 91, of the General Laws.

DIVISION OF WATERWAYS

In the course of performing the above-mentioned functions and duties during fiscal 1969, hearings were held by the Department, acting under the provisions of Section II of said Chapter 91, on petitions for the improvement, development, maintenance and protection of tidal and non-tidal rivers and streams, harbors, tidewaters, foreshores and shores along public beaches. Hearings were also held on petitions for licenses for structures in, over or under tidewaters, great ponds and certain streams and for permits for excavation or dredging in same; and, subsequently, 30 permits and 160 licenses were granted, 33 contracts were completed and 35 contracts were awarded.

In addition, numerous inspections have been made and reports submitted on (1) the progress of construction under licenses and estimates for billing under same, (2) unlicensed encroachments, (3) research relative to existing licenses and licensed structures, (4) assignments of great ponds to be surveyed and (5) petitions for establishment of rights-of-way to great ponds; annual legislative reports on progress of surveys of great ponds and the establishment of rights-of-way thereto. The granting and issuance of leases (deeds in certain instances) and permits for use and occupancy of State-owned land and other properties under the jurisdiction of the Division, including the islands in the great ponds, have also been a function of the Division, as well as replying to the continual and extensive inquiries from the public relative to their rights and responsibilities in the tidal waters and great ponds.

DIVISION OF WATERWAYS

The Division has processed over 500 applications for requests to fill on marshlands (Chapter 130, Section 27A and Chapter 31, Section 117C).

The Division of Waterways, acting as the design and contracting agent for the Public Access Board, has completed the following work during fiscal 1969:

Projects under design	13
Projects under construction	2
Projects completed	6

The Division of Waterways has 11 projects scheduled for design and 8 projects ready for construction this fiscal year of 1970. Since 1963 when the Public Access Board was established, the Division of Waterways has completed 50 boat launching ramps and facilities.

The Division of Waterways also acts as the design and contracting agent for recreational facilities (skating rinks and swimming pools) as authorized under Chapter 632 of the Acts of 1966, and in fiscal 1969 has completed the following work:

Projects under construction:

5 Skating Rinks
7 Swimming Pools

Projects under design -- none

Projects completed:

3 Skating Rinks
2 Swimming Pools

The Division hopes to complete the remaining 7 projects during this fiscal year of 1970.

DIVISION OF WATERWAYS

During fiscal 1969, the Division supervised the transportation of solid waste across Massachusetts Bay and the offshore burning of approximately a quarter of a million tons of combustible building demolition material. It is anticipated that with construction of the central artery this figure will increase to one half million tons in fiscal 1970.

DIVISION OF WATERWAYS

CONSTRUCTION CONTRACTS AWARDED
JULY 1, 1968 TO JUNE 30, 1969

<u>CONT.</u> <u>NO.</u>	<u>LOCATION</u>	<u>TYPE OF</u> <u>WORK</u>	<u>CONTRACTOR</u>	<u>EST.</u> <u>COST</u>
2615	Worcester	Stream Improv.	Corio Bros. Constr. Co.	\$691,720.00
2643	New Bedford	Dredging	Perini Corporation	930,000.00
51(PA)	Falmouth	Access Facilities	Frederick V. Lawrence, Inc.	20,395.00
50(PA)	Scituate	Access Facilities	Ernest Minelli, Jr.	64,175.00
2632	Harwich	Marina facility	Kidd Constr. Corp.	297,560.00
2481	Hull	Sea Wall	Ernest Minelli, Jr.	19,400.00
2644	Wellfleet	Dredging	Hydro-Dredge Corp.	140,800.00
53(PA)	Yarmouth	Access Facilities	Fairhaven Marine Inc.	57,076.00
2637	Springfield	Concrete Pipe Conduit	Roy M. Wright, Inc.	115,690.00
2650	Scituate	Sea Wall	A. Singarella & Sons, Inc.	71,920.00
2649	Fairhaven	Concrete Pipe Culvert	Coast Constr. Co.	6,905.00
2653	Quincy	Dredging	Perini Corporation	72,090.00
2466	Springfield	Stream Improv.	B & M Constr. Inc.	146,698.50
54(PA)	Dennis	Access Facilities	Campanella Corp.	68,538.00
48(PA)	Monterey	Access Facilities	Arthur H. Hebert & Son, Inc.	49,652.70
2633	Randolph	Stream Improv.	R & J Salvucci Corp.	63,082.00
2657	Harwich	Dredging	North Atlantic Dredging Co.	44,056.00

DIVISION OF WATERWAYS

CONSTRUCTION CONTRACTS AWARDED
JULY 1, 1968 TO JUNE 30, 1969 (CONT'D)

<u>CONT. NO.</u>	<u>LOCATION</u>	<u>TYPE OF WORK</u>	<u>CONTRACTOR</u>	<u>EST. COST</u>
2445	Shrewsbury	Stream Improv.	G. Bonazzoli & Sons	\$204,400.00
55(PA)	Bridgewater	Access Facilities	K. R. Rezendes, Inc.	42,776.50
2647	Adams	Stream Improv.	B & M Constr. Inc.	38,200.00
2659	Winthrop	Beach Improv.	Bonacorso Constr. Corp.	87,300.00
2591	Weymouth	Flood Control	Piatelli Constr. Corp.	172,970.00
2663	Plymouth	Sea Wall & Groin	Ernest Minelli, Jr.	91,950.00
56(PA)	Merrimac	Access Facilities	Salisbury Constr. Co.	29,946.00
2662	Falmouth	Bulkhead Repairs	Hilmer W. Klang	13,699.44
83	Westfield	Swimming Pool	Ciolek Constr. Co., Inc.	209,258.00
89	Worcester	Swimming Pool	Granger Bros., Inc.	232,390.00
85	Milford	Swimming Pool	Consigili Constr. Co.	223,000.00
91	Fitchburg	Swimming Pool	Leominster Engr. Co.	201,000.00
87	So. Hadley	Swimming Pool	E. J. Pinney Co., Inc.	217,190.00
96	Salisbury	Toll Station	So. Boston Constr. Co.	6,340.00
86	North Adams	Skating Rink	Ciolek Constr. Co., Inc.	788,138.00
101	Greenfield	Skating Rink	Ciolek Constr. Co., Inc.	744,934.00
92	Ludlow	Swimming Pool	Ciolek Constr. Co., Inc.	214,841.00
102	Fairhaven	Recreation Facilities	M & M Maintenance & Construction Corp.	28,373.75
35 PROJECTS			TOTAL	\$6,407,464.89

DIVISION OF WATERWAYSPROJECTS UNDER CONSTRUCTION
JUNE 30, 1969

<u>CONT.</u> <u>NO.</u>	<u>LOCATION</u>	<u>TYPE OF</u> <u>WORK</u>	<u>CONTRACTOR</u>	<u>EST.</u> <u>COST</u>
55PA	Bridgewater	Access Facilities	K. R. Rezendes	\$42,776.50
2622	Chilmark	Dock Facilities	Bonacorso Const. Corp.	191,566.00
91B	Fitchburg	Swimming Pool	Leominster Engr. Co.	209,400.00
101B	Greenfield	Skating Rink	Ciolek Constr. Co.	744,934.00
2657	Harwich	Dredging	No. Atlantic Dredging Co.	14,056.00
2632	Harwich	Marina Facility	Kidd Constr. Co.	297,560.00
2481	Hull	Sea Wall	Ernest Minelli, Jr.	19,400.00
92B	Ludlow	Swimming Pool	Ciolek Constr. Co.	214,841.00
85B	Milford	Swimming Pool	Consiglio Constr. Co.	231,470.00
48PA	Monterey	Access Facilities	Arthur N. Hebert & Sons, Inc.	49,652.70
86B	No. Adams	Skating Rink	Ciolek Constr. Co.	780,011.00
2633	Randolph	Stream Improv.	R & J Salvucci Corp.	63,082.00
963	Salisbury	Toll House	So. Boston Constr. Co.	6,340.00
2650	Scituate	Sea Wall	A. Singarella & Sons, Inc.	71,920.00
2445	Shrewsbury	Stream Improv.	G. Bonazzoli & Sons	204,400.00
2466	Springfield	Stream Improv.	B & M Constr. Co.	146,698.50

DIVISION OF WATERWAYS

PROJECTS UNDER CONSTRUCTION
JUNE 30, 1969 (CONT'D)

<u>CONT. NO.</u>	<u>LOCATION</u>	<u>TYPE OF WORK</u>	<u>CONTRACTOR</u>	<u>EST. COST</u>
83B	Westfield	Swimming Pool	Ciolek Constr. Co.	\$216,958.00
2659	Winthrop	Harbor Improv.	Bonacorso Constr. Co.	87,300.00
2615	Worcester	Flood Control	Corio Bros., Inc.	691,720.00
89B	Worcester	Swimming Pool	Granger Bros., Inc.	<u>240,890.00</u>
		20 PROJECTS	TOTAL	\$4,554,965.90

DIVISION OF WATERWAYS

CONSTRUCTION PROJECTS COMPLETED
JULY 1, 1968 TO JUNE 30, 1969

<u>CONT.</u> <u>NO.</u>	<u>LOCATION</u>	<u>TYPE OF</u> <u>WORK</u>	<u>CONTRACTOR</u>	<u>COST</u>
2561	Auburn	Drainage	Lowell Engineering	\$108,101.15
81B	Brockton	Skating Rink	Marshall Constr. Co.	739,086.00
2594	Chicopee	Drainage	G. Bonazzoli & Sons	167,813.00
36PA	Easthampton	Access Facilities	Warner Bros., Inc.	42,167.00
2606	Edgartown	Dredging	Hydro Dredge Corp.	96,877.08
45PA	Edgartown	Access Facilities	White Bros. Constr. Co.	50,144.40
98B	Fairhaven	Beach Improv.	K. R. Rezendes	103,688.75
2627	Falmouth	Dredging	Hydro-Dredge Corp.	25,785.93
51PA	Falmouth	Access Facilities	F. V. Lawrence	19,743.50
2642	Gloucester	Wreck Removal	Coastwise Towing Co., Inc.	10,935.00
2628	Harwich	Dredging	Hydro Dredge Corp.	134,740.00
2630	Holyoke	Bank Protection	Haber Sand & Gravel Co.	16,920.00
82B	Holyoke	Swimming Pool	Ciolek Constr. Co.	219,319.00
2595	Marshfield	Shore Protection	Ernest Minelli, Jr.	64,326.00
2597	Milton	Stream Improv.	T & T Construction	75,745.00
	Nantucket	Bicycle Path	Walter F. Glowaski	77,255.30
2643	New Bedford	Dredging	Perini Corp.	924,000.00
2178	Newton	Stream Improv.	Ablondi-Boynton Corp.	388,578.75

DIVISION OF WATERWAYS

CONSTRUCTION PROJECTS COMPLETED
JULY 1, 1968 TO JUNE 30, 1969 (CONT'D)

<u>CONT.</u> <u>NO.</u>	<u>LOCATION</u>	<u>TYPE OF</u> <u>WORK</u>	<u>CONTRACTOR</u>	<u>COST</u>
2593	Orleans	Pier Repairs	Fernandes Crane Service Inc.	\$5,671.20
47PA	Pittsfield	Access Facilities	Western Mass. Contr. Engrs.	32,538.05
2635	Plymouth	Stone groin	Kidd Constr. Corp.	9,894.60
2653	Quincy	Dredging	Perini Corp.	62,600.00
100B	Salisbury	Sea Wall	Ernest Minelli, Jr.	76,180.40
2616	Scituate	Shore Protection	A. Singarella & Sons, Inc.	43,346.00
80B	Springfield	Skating Rink	Ciolek Constr. Co.Inc.	736,153.00
87B	Hadley	Swimming Pool	E. J. Pinney Co.,Inc.	218,660.00
2634	Truro	Dredging	North Atlantic Dredging Co.	79,174.00
2636	Truro	Trestle Removal	Jay-Mor Constr. Co.	12,162.00
2644	Wellfleet	Dredging	Hydro Dredge Corp.	155,250.00
2641	Weymouth	Beach Improv..	Sylvester A. Ray	225,394.45
2619	Winthrop	Sea Wall	Bonacorso Const. Co.	14,449.70
2625	Winthrop	Dredging	Perini Corp.	1,077,560.00
84B	Worcester	Skating Rink	Granger Bros., Inc.	<u>747,300.00</u>
33 PROJECTS COMPLETED				\$6,761,559.26

DIVISION OF WATERWAYSPROJECTS UNDER ASSIGNMENT FOR
SURVEY & DESIGN JUNE 30, 1969

<u>CONT. NO.</u>	<u>LOCATION</u>	<u>TYPE OF WORK</u>	<u>CONSULTANT OR DEPARTMENT</u>	<u>EST. COST</u>
2601	Adams	Pine Street Brook Improvement	Waterways	\$25,000.00
	Barnstable	Dredging East Bay, Osterville & Seapuit River	Waterways	150,000.00
	Barnstable	Rebuild groins Cotuit, Loop Beach	Waterways	12,000.00
		Dredging narrows Osterville & Cotuit	Waterways	88,000.00
	Bedford	Flood Control Kiln Brook	Edwards & Kelcey	5,000.00
	Boston	Hyde Park, Enclose Colburn St. brook		40,000.00
	Boston	Access Ramp Charlestown	Whitman & Howard	150,000.00
	Canton	Ponkapog Pond Access Ramp	Waterways	5,000.00
	Chatham	2 Locations. Dredging & Revetment	Waterways	120,000.00
		2 Locations Revetment & Sand Fill	Waterways	17,000.00
	Danvers	Porter & Crane Rivers Dredging	Waterways	375,000.00
	Danvers	Beaver Brook Ext. of Rip Rap	Waterways	10,000.00
	Dartmouth	Lloyd P. Demarest Park Access Ramp	Waterways	50,000.00

DIVISION OF WATERWAYS

PROJECTS UNDER ASSIGNMENT FOR
SURVEY & DESIGN JUNE 30, 1969 CONT'D

<u>CONT.</u> <u>NO.</u>	<u>LOCATION</u>	<u>TYPE OF</u> <u>WORK</u>	<u>CONSULTANT OR</u> <u>DEPARTMENT</u>	<u>EST.</u> <u>COST</u>
	Dedham	Wigwam Brook-4th stage Flood control	Waterways	\$200,000.00
	Dennis	Swan River Jetty ext. & revet.	Waterways	16,000.00
	Eastham	2 Locations Groins	Waterways	16,000.00
	Fairhaven	Cushman Park Drainage	W. E. Rowley	40,000.00
	Falmouth	Falmouth Heights Shore Protection	W. E. Rowley	70,000.00
	Freetown	Long Pond Access Ramp	Waterways	35,000.00
	Gloucester	Mill River Sluice Gate		50,000.00
	Hamilton	Chebacco Lake Access Ramp	Waterways	40,000.00
	Hanover	Iron Mine Brook Stream Clearance	Waterways	20,000.00
	Hanover	King Street-Forge Pond Stream Improvements	Waterways	40,000.00
2660	Hingham	Town Brook & Salt Meadow Study	Whitman & Howard	22,500.00
	Hull	Ocean Avenue Sea Wall	Waterways	20,000.00
2652	Ipswich	Farley Brook Stream Improvements	Waterways	50,000.00
	Ipswich	Miles River	Waterways	10,000.00

DIVISION OF WATERWAYSPROJECTS UNDER ASSIGNMENT FOR
SURVEY & DESIGN JUNE 30, 1969 (CONT'D.)

<u>CONT. NO.</u>	<u>LOCATION</u>	<u>TYPE OF WORK</u>	<u>CONSULTANT OR DEPARTMENT</u>	<u>EST. COST</u>
	Kingston	Kingston Bay Study	Waterways	\$10,000.00
	Lawrence	Spickett River	Waterways	16,000.00
2536	Lexington	Kiln Brook Stream Improvements	Edwards & Kelcey	60,000.00
	Manchester	Beach Street Tidal Cahmber & Tide Gate		15,000.00
2646	Marblehead	Pier Construction	Waterways	35,000.00
	Marion	Silvershell Beach Ext. of Groin	W. E. Rowley	12,000.00
	Marshfield	Green Harbor Sea Wall Reconstruction	Waterways	12,000.00
	Marshfield	Ocean Bluff Repair & Reconst. of Seawall		36,000.00
		Dyke Road Riprap (Vic. Tide Gates)		24,000.00
58PA	Mashpee	Access Facilities	Waterways	27,000.00
	Mattapoisett	Barstow Wharf Repairs	Waterways	2,000.00
56PA	Merrimac	Access Facilities	Waterways	33,000.00
	Middleborough	Nemasket River Stream Improvements	Waterways	20,000.00
	Milford	Charles River 3rd Phase Town Line to Archer Rubber	Duffill Assoc.	420,000.00
2656	Milford	Lake Louisa Dam	Andrew Christo	400,000.00
	Nantucket	Madakett Harbor & Hither Creek Dredging	Waterways	80,000.00

DIVISION OF WATERWAYS

PROJECTS UNDER ASSIGNMENT FOR
SURVEY & DESIGN JUNE 30, 1969 (CONT'D)

<u>CONT. NO.</u>	<u>LOCATION</u>	<u>TYPE OF WORK</u>	<u>CONSULTANT OR DEPARTMENT</u>	<u>EST. COST</u>
	New Bedford	Clarks Cove Dredging	Waterways	\$125,000.00
	New Bedford	Public Landing		9,000.00
	North Attleboro	Falls Pond Dam Access Ramp	Whitman & Howard	160,000.00
	Oak Bluffs	Bulkhead	Fay, Spofford & Thorndike	180,000.00
	Orleans	Rock Harbor Bulkhead	W. E. Rowley	70,000.00
	Otis	Shaw Pond Access Ramp	Waterways	20,000.00
	Peabody	Proctors Brook Flood control at dam	Gibbs & Hill	125,000.00
	Peabody	Proctors Brook Flood control upstr. of Lowell St.	City of Peabody	100,000.00
	Peabody	Strongwater Brook Flood control	City of Peabody	40,000.00
	Pittsfield	Lake Onato Beach Development		375,000.00
	Plymouth	Town Wharf Repairs		20,000.00
	Plymouth	Town Wharf Bulkhead		70,000.00

DIVISION OF WATERWAYS

PROJECTS UNDER ASSIGNMENT FOR
SURVEY & DESIGN JUNE 30, 1969 (CONT'D)

<u>CONT.</u> <u>NO.</u>	<u>LOCATION</u>	<u>TYPE OF</u> <u>WORK</u>	<u>CONSULTANT OR</u> <u>DEPARTMENT</u>	<u>EST.</u> <u>COST</u>
2629	Quincy	Sea Wall, Stairs & Ramp Reconstruction Adams Shore	Waterways	\$10,000.00
2651	Quincy	Palmer Street Stone Mound and Blocks	Waterways	50,000.00
2654	Quincy	Edgewater Drive Stone Mound and Blocks	Waterways	30,000.00
	Quincy	Rock Island Cove Wreck Removal	Waterways	5,000.00
	Richmond	Richmond Pond Access Ramp	Waterways	60,000.00
99B	Sandwich	Scusset Beach Improvements	Andrew Christo	550,000.00
	Sandwich	3 Locations	W. E. Rowley	64,000.00
	Salem	South River Improvements	Camp, Dresser & McKee	550,000.00
	Scituate	Sand Hills Flood Control		20,000.00
	Scituate	Sand Hills Beach Stone Revetment		50,000.00
	Southbridge	Nuisance Brook Stream Improvements	Cullinan	50,000.00
	Spencer	Muzzy Meadow Brook Stream Improvements		100,000.00
57PA	Sutton	Access Facilities	Waterways	40,000.00
	Swampscott	Coles River Beach Erosion Study	Waterways	10,000.00
	Swansea	Stream Improvements		20,000.00

DIVISION OF WATERWAYS

PROJECTS UNDER ASSIGNMENT FOR
SURVEY & DESIGN JUNE 30, 1969 (CONT'D)

<u>CONT. NO.</u>	<u>LOCATION</u>	<u>TYPE OF WORK</u>	<u>CONSULTANT OR DEPARTMENT</u>	<u>EST. COST</u>
	Tisbury	Lake Tashmoo Dredging	Waterways	\$60,000.00
	Tisbury	West Chop Repair jetty & bank revetment		20,000.00
2631	Wakefield	Saugus & Mill Rivers Stream Improvements	Edwards & Kelcey	100,000.00
	Wareham	3 Locations	Waterways	300,000.00
	Westfield	Westfield River Stream Improvements	Waterways	20,000.00
	West Newbury	Merrimac River Access Ramp	Waterways	40,000.00
	West Stockbridge	Shaker Mill Dam Reconstruction		50,000.00
95B	Westport	Gooseberry Neck Causeway Reconstr.		100,000.00
2664	Weymouth	Back River and Herring Brook 3rd Phase	Metcalf & Eddy	930,000.00
	Winthrop	Winthrop Harbor Access Site	Whitman & Howard	150,000.00
	Winthrop	3 Locations		65,000.00
2618	Woburn	Tabbutts Brook Stream Improvements	Waterways	15,000.00
2604	Woburn	Middlesex Canal Stream Improvements	Abe Woolf	100,000.00

DIVISION OF WATERWAYS

PROJECTS UNDER ASSIGNMENT FOR
SURVEY & DESIGN JUNE 30, 1969 (CONT'D)

<u>CONT. NO.</u>	<u>LOCATION</u>	<u>TYPE OF WORK</u>	<u>CONSULTANT OR DEPARTMENT</u>	<u>EST. COST</u>
2671	Worcester	Ararat Street Brook Stream Improvement	Andrew Christo	\$600,000.00
	Worcester	Patches Reservoir Flood Control	Camp, Dresser & McKee	250,000.00
		82 PROJECTS	TOTAL	<u>\$8,481,500.00</u>

DIVISION OF WATERWAYS

EXPENDITURES

FISCAL 1969

Ordinary Maintenance & Administration Division	\$749,300.00
State Pier at Plymouth	12,757.00
State Pier at New Bedford	<u>24,657.00</u>
	\$ 786,714.00
Dredging & Construction	<u>6,761,559.26</u>
TOTAL WATERWAYS EXPENDITURES	\$7,548,273.26
Construction Work Performed for Public Access Board in Fiscal 1969	\$199,446.15
Construction Work Performed on Recreational Facilities (Skating Rinks & Swimming Pools) in Fiscal 1969	\$2,660,508.00

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BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

The Bureau of Transportation Planning and Development, Massachusetts Department of Public Works, was established in accordance with legislation adopted by the Acts of 1964, Chapter 563. The executive and administrative head of the Bureau is the Director of Transportation Planning and Development.

This Bureau serves as the principal source of transportation planning in the Commonwealth and conducts research, surveys, demonstration projects, and studies in cooperation with the Federal government, other governmental agencies, and appropriate private organizations and is responsible for the continual preparation of comprehensive and coordinated transportation plans and programs. In addition it maintains a data bank of all available transportation information statistics for reference use by all public agencies in the Commonwealth.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

TRAFFIC FORECASTING AND ASSIGNMENTS

In the year Fiscal 1968, traffic forecasts were developed for approximately seventy-five (75) projects varying in size and scope for contemplated highway improvements. During this period, changes in traffic networks were designed to investigate new route concepts within the context of the individual urban transportation study areas. This methodology allowed for conformity between the process as a whole and the individual highway segments being evaluated. Major projects evaluated and forecasts prepared are as follows:

- | | |
|-----------------|--------------------------|
| 1. Route I-895 | Attleboro - Rhode Island |
| 2. Route 6 | Dennis - Harwich |
| 3. Route 52 | Sterling - Ashburnham |
| 4. Route 62 | Concord - North Reading |
| 5. Route I-95 | Boston - Revere |
| 6. Route 7 & 20 | Pittsfield |

The Fitchburg-Leominster Urban Area Transportation Study was rezoned and recoded for external trips to develop a new distribution of trips to a defined network that would be consistent with the procedures presently being utilized by the Department in network analysis.

Additionally, investigations and analysis were made into traffic behavior patterns in the areas of peak hour flow, daily and monthly demand patterns, and time series volume trend relationships.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

TRAFFIC VOLUME DATA ANALYSIS

The report entitled, "Traffic Volume Data Research" was published in June 1968 and was released in March 1969 for general distribution.

TRAFFIC VOLUME COUNTING PROGRAM

Approximately 4,000 volume counts were taken during fiscal 1969 from permanent traffic counting stations, control counting stations, coverage counting stations and special volume counts.

Turning movement studies and vehicle classification studies, required for project design, were conducted at various locations throughout the State.

Recorder tapes were reviewed and edited for the permanent and control stations and the results were forwarded to the Bureau of Public Roads.

The 1969 Traffic Volume Counting Program was completely revised to reflect the volume data requirements of the Highway Classification Phase of the Statewide Highway Transportation Study. This requires the taking of volume counts on all classes of roads and not just on numbered routes as in the past.

Plans were developed for the installation of automatic counting by the Maintenance Force in the Department.

Work was started on the 1968 Traffic Volumes Report.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

VEHICLE WEIGHT AND CLASSIFICATION STUDY

The Annual Vehicle Weight and Classification Study was conducted with the Bureau of Public Roads during the July - August period at fourteen locations throughout the State. The purpose of the study was to establish truck characteristics relative to magnitude composition, axel weights, gross weights and commodities carried. Results of this study were being compiled and entitled "1968 Truck Weight Study" will be published soon.

RURAL AND URBAN HIGHWAY MILEAGE ANALYSIS

The Annual Mileage Reports for the calendar year ending December 31, 1968 were completed and forwarded to the Bureau of Public Roads.

Highway mileage, both local and State are reported on a series of forms which are interrelated as to total mileage analysis. Each report, however, reflects a separate and individual mileage analysis.

Collectively, they represent the mileages, rural, urban and municipal on Federal Aid system by surface types, widths, average daily traffic and access control.

Publications printed and distributed were:

1. Local Road Mileages - December 31, 1968
2. Highway Mileage Statistics - 1968

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

HIGHWAY VEHICLES USING FUELS OTHER THAN GASOLINE

The Annual Report on vehicles using diesel oil for fuel was completed and forwarded to the Bureau of Public Roads.

Both the number of owners and the number of each type of vehicle were indicated in this report.

LOCAL HIGHWAY FINANCE ANALYSIS

Work in 1969 included collecting and analyzing the receipts and disbursements for all highway purposes by the local government units in Massachusetts. The statistical report prepared from the data usually contained in Schedule A of the annual city and town financial reports are submitted to the Bureau of Accounts, Department of Corporation and Taxation.

The collection of the data represents a tremendous amount of effort in verifying and analyzing the accounts to fulfill the detailed categories of expenditures and receipts required by the Bureau of Public Roads' "535" Report. In addition, data from each of the 351 cities and towns was assembled by groups according to population; for Standard Metropolitan Areas and for counties.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

This report also covers information relating to the Maurice J. Tobin (Toll) Bridge and the Callahan and Sumner Tunnels of the Massachusetts Port Authority, the turnpikes of the Massachusetts Turnpike Authority and the public parking facilities of the Massachusetts Parking Authority.

RURAL AND URBAN INVENTORY

During the year, a detailed study was made of past methods employed in the conduct of Rural and Urban Road Inventory Programs both in Massachusetts and other selected states. This study resulted in the production of the "Massachusetts Road and Street Inventory Program Manual of Instructions". More comprehensive than earlier attempts of this kind, the manual won the approval of the Department and the Bureau of Public Roads and, at year's end, was being readied for final printing and subsequent nationwide distribution.

New work sheets were developed for the collection of road and street, bridge structure and railroad grade crossing data. These sheets provide for a maximum amount of the overall coding operation being completed in the field with an expected savings of time and resources while minimizing handling and errors.

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The new manual also outlines procedures to be followed in the collection of data pertaining to future special inventories concerned with (a) Gradient, (b) Curvature, (c) Passing Sight Distance, (d) Interchanges and Collector-Distributors, (e) Service Facilities at Expressway Interchanges, (f) The Collection and Assignment of Traffic Accident Data and (g) Stopping Sight Distance at Railroad Grade Crossings.

Instructional classes for field personnel were completed and new field manuscripts were prepared. The Five-Year Program of updating the original road inventory data bank was expected to commence by the end of July, 1969 with the first year's work to be concentrated in Berkshire, Hampden, and Franklin Counties.

BRIDGE RECORD

The Annual "Bridge Record" Report was prepared and printed. It was prepared at the request of the Bureau of Public Roads for use of the Department of Defense in their activities. The report shows the carrying capabilities, horizontal and vertical clearances of all highway structures which might reasonably be used for important defense shipments, the through movements of troops, military equipment and supplies or for evacuation of disaster areas.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

MAPPING - RURAL AND GENERAL

Several revisions were made in the Federal Aid Highway Systems and Urban Area delineations.

Work continued on indexing mylars for inventory work.

Two complete sets of County maps were made for the Statewide Highway Transportation Center, one showing the Federal Aid Systems and the other the State Highway System.

Reported changes in the General Highway Maps were placed on a master copy which will be the basis of updating every five years.

INTERSTATE TRAVELED-WAY STUDY

This Study as such was inactive in 1969, however much of the work covered by the Study was integrated in other programs.

FEDERAL AID SYSTEM REVISION

This item is covered in the Section - Mapping, Rural and General.

INVENTORY OF TRAFFIC CONTROL DEVICES

This project consists of a continuous inventory of traffic signals throughout the Commonwealth. The inventory is eighty-five percent complete as of June 30, 1969 (fiscal 1969). In conjunction with this inventory, the Districts are continuing a signal updating program.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

ACCIDENT REPORT BY SYSTEMS

A compilation of accidents throughout the Commonwealth on the various highway systems for 1968 was started in order to complete Table TA-1, as described in Instructional Memorandum 50-7-66 from the Bureau of Public Roads.

REVISED INTERSTATE COST SYSTEM

The detailed estimate of cost as of 1969 to complete the National System of Interstate and Defense Highways in the Commonwealth of Massachusetts was started in the Spring of 1969 and is expected to be completed early in the next fiscal year for submittal to the Bureau of Public Roads.

The publication of this revised estimate is in compliance with Section 104(b), (5), Title 23, U. S. Code, Highways.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

STATEWIDE HIGHWAY TRANSPORTATION STUDY

HIGHWAY NEEDS STUDY

As part of the Statewide Highway Transportation Study a contract was awarded to Allinson Consultants by the Department on May 25, 1966 for a Needs Study of roads and streets in the Commonwealth.

The work plan for the Needs Study involved a mile-by-mile determination of deficiencies and needed construction improvements on 10,254 miles of roads and streets which were included in the ten arterial functional classification groupings.

A mass sampling technique was employed for 18,588 miles of road and streets which functionally are local service facilities.

Needs are appraised to the year 1990 and the average annual costs developed in the program analysis included allowances for maintenance, administration, safety, stop-gap and replacement costs.

The Consultant furnished 3,000 copies of the final report in February, 1969. Release of the reports are scheduled for July, 1969 after a presentation of the recommendations of the Study has been made to both the Citizens and Legislative Advisory Committee appointed by the Governor and the Engineering Advisory Committee.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

The appraised program costs to 1990, based on 1965-1966 construction costs, reveals that the recommended systems will require an expenditure of 9.3 billion dollars to bring the highway facilities up to acceptable standards.

Recommended State Primary System	\$3.498 billion	
Recommended State Secondary System	1.553	"
Recommended City-Town Major Arterial System	1.782	"
Recommended City-Town Minor Arterial System	.936	"
City-Town Local Access System	1.422	"
Recommended MDC System	.079	

NEEDS UPDATE

Arterial File Format Change

In considering the continuing phases of the Needs Study, certain data on the master Arterial File appeared to be somewhat space restricted and the following corrective measures were adopted:

1. Structure and Railroad Protection items on a study section have been restricted to nine items. We expanded this one digit field to a two digit field which will allow up to ninety-nine of these items per study section.
2. The design Standard is presently a one digit field. Eventual Needs Costing Computer Programs will necessitate expanding the number of Standards to take care of most roadway improvement sections; therefore, we expanded this one digit field to a two field as above.

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3. The Structure and Railroad Protection Cost of a study section is currently a four digit field which has already restricted the natural input of several study section structure costs in the multimillions of dollars. We added a position to this field which will allow a total Structure and Railroad Protection Cost of between one-thousand and ninety-nine million dollars.

Merged Arterial and Structural File

In reformatting the Arterial Data File and the Structural Data File for the Needs Study Section, certain fields were purposely added and others were moved to allow these files to be eventually merged into one file through computer programming. The computer generated output of this effort resulted in merged files arranged in the same manner as the original work sheets; that is, by county, by town, by F-Rte., and by section, with any related Structure or Railroad Protection falling in numbered order directly behind or beneath its Arterial Section record.

It would have been impossible to prepare a merge program or sort of these files if the "F-Rte" idea was not adhered to before Allinson Consultants, Inc. split up the data into six files for their edit and tabulations. As it was, it has taken considerable time to rework these files into a functional form.

Sequenced Arterial Printouts

Printouts of all arterial section records comprising the classified system are sequenced in the following order:

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1. By county.
2. By city or town within the county.
3. By "F-Rte" within the city or town.
4. By study section number on each "F-Rte".

Structural File

Printouts of the merged and sorted rural, urban and future urban structural files. To permit proper sorting several pre-processing operations were necessary as follows:

1. The transferring of the "F-Rte" number onto each structural record from the related arterial record.
2. The transferring of the Boston District Number onto each structural record from the related arterial record.
3. Expansion of the section number field to accommodate two digits.
4. Addition of two record positions to allow for a structure sequence number on a given section and generation of said sequence number in this position.
5. Addition of six record positions for serialization to be used in file updates.
6. Card control numbers changed from original general structural digit No. 3 to No. 4 on rural records, No. 5 on Urban records and No. 6 on future urban records..
7. The transposing of various fields to coincide with related arterial fields.

These 4,047 structural records were hand edited and corrected where necessary so that they will agree with the needs merged arterial data edited by the Needs Study Staff.

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A template identifying the various fields on this structural file printout was used. Upon completion of the edit by the Needs Study Staff, the Data Processing Section wrote, keypunched, verified, and ran the computer update on this file. The corrected file was then returned for further edit.

CAPACITIES - 68-01 TAB

Staff completed capacity data coding sheet for Tab 68-01. This coding was for capacities by study section, both rural and urban, for approximately 10,250 miles of the statewide classified arterial systems.

This coding data was keypunched, verified and checked. A printout of Tab 68-01 was generated.

Traffic Data

Established a program to assemble traffic volume data on General Highway Series Maps for future highway volume-capacity ratios and vehicle miles-of-travel data.

GENERAL

Furnished needs study information to Department personnel, regional planning agencies, consultants, Bureau of public Roads, Task "A", Inner Belt Study, and to local communities.

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Procedures were developed as part of our road inventory program, to collect updated information on curve and grade data, passing sight distance, railroad grade crossings and bus routes for future studies.

Documentation was prepared describing the various work items necessary for the completion of a Needs Study. The purpose of the document being two-fold. First, to provide information for continuity to personnel in the Department concerning the needs phase of the study. Second, to provide a service to local, state and federal agencies contemplating similar studies.

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STATEWIDE HIGHWAY TRANSPORTATION STUDY

HIGHWAY CLASSIFICATION PHASE

The Highway Classification Phase of the Statewide Highway Transportation Study was initiated in April, 1966 with the awarding of a contract with the Automotive Safety Foundation for technical advisory services.

The Classification phase of the total study was conducted in two parts.

The first part was concerned solely with functional classification. Each road and street was evaluated to determine its function as a part of the state's total highway network; the purpose it serves; the kind of traffic service rendered and its relative level of importance.

The second part of the classification phase involved analysis of alternate plans for administrative systems to determine which arrangement, consistent with future economic and population needs, will provide the most orderly reassignment of responsibilities among the several levels of government.

A final report entitled "A Statewide Highway Transportation Plan - Road and Street Responsibilities", was prepared and submitted in September, 1968. The report sets forth the fundamentals of sound highway classification and recommends the

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establishment of clearly defined state highway, town road and city street systems.

The proposed State Primary System, totalling 2125 miles, is composed of the first three statewide functional classes of roads and streets and the proposed State Secondary System totalling 2142 miles, consists of the fourth and fifth functional classes of roads and streets. Together, the proposed State Primary and State Secondary Systems, totalling 4267 miles, connect all places in Massachusetts of 1000 population and over. Approximately 83 percent of the State's total population and 98 percent of its major industrial plants are within one mile of routes of the combined systems. The proposed State Systems would represent an increase of approximately 58 percent over the existing State System.

During the year, numerous presentations of the highway classification phase were made to various state, and local agencies and other interested parties.

Also numerous requests for the functional classification of roads for communities preparing 701 Master Plans were made by many Planning Consultants.

The current major activity of the Classification section is the conducting of the National Highway Functional Classifica-

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tion Study required by Section 17 of the 1968 Federal-aid Highway Act. The manual providing background data, definitions, methods and data submitted instruction for the conduct of the study by all states was received in April 1969. The results of the study are due in the Washington Office of the Bureau of Public Roads on November 3, 1969.

The study requires the classifying of all existing public roads and streets within the state on the basis of the most logical usage of existing facilities to serve present travel and land use.

The National Classification Study is being conducted according to the guidelines and criteria established by the Bureau of Public Roads and maximum use is being made of the previously completed classification study.

Other activities during the year included:

The preparation of field manuscripts showing the functional classification of all roads and streets for use in the road and street inventory program.

The initial development of the new Federal-Aid Primary Type II networks in urban areas in conjunction with the TOPICS program.

The continuous updating of the Highway Classification Plan including the current mileage and travel data developed for the Plan.

The continuous liaison with Department, State and local officials.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

STATEWIDE HIGHWAY TRANSPORTATION STUDY

FISCAL PHASE

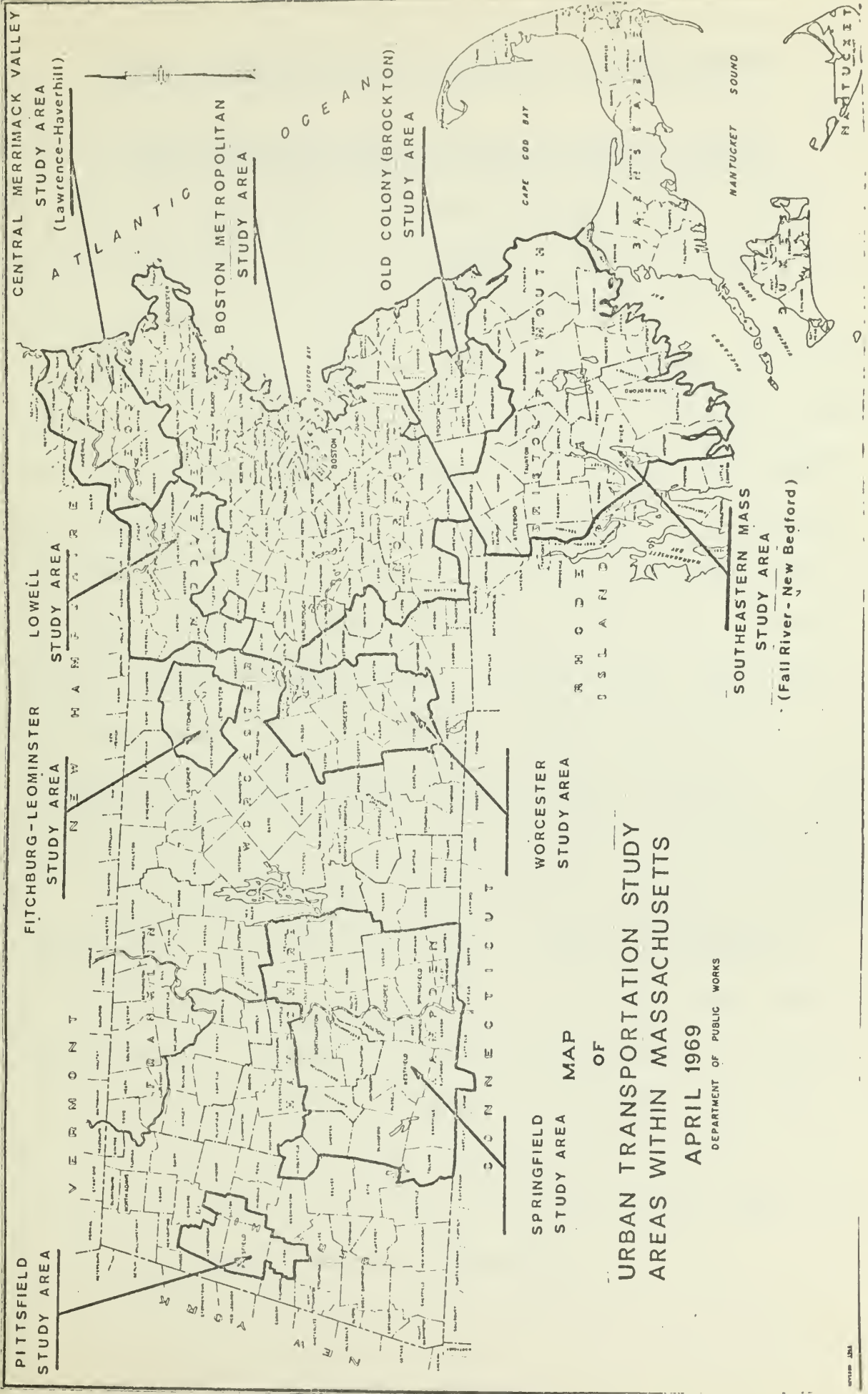
From July 1, 1968 to June 30, 1969 - during the reviews and edits of drafts, galley proofs and blueprints of the consultants' final report - the staff continued to develop and supply relevant data and other material. During the review and edit process suggested revisions in the text and in tabular and graphic material were prepared and submitted. Although it is entirely a consultant responsibility, the report was followed closely from the initial draft to final printing to insure consistency with the staff findings and background material supplied including various reports and over 350 tables of supporting information.

The final report entitled "Financial Requirements to 1990" was completed by the Consultant and is scheduled for release to the public in July after a presentation of the recommendations to both the Citizens and Legislative Advisory Committee and the Engineering Advisory Committee.

During the year, the fiscal staff was engaged in updating tabulations and other material both for current use and as a basis for the continuing phase of the study. Graphic presentation of many of the basic tables was initiated with the final objective of providing a series of graphs relating to highway finance depicting both historic trends and future projections.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

Other responsibilities included the provision of material and data to other planning agencies and to various federal, state and local government departments and divisions. Numerous special reports, tables, etc. were prepared by the staff upon request for agencies such as the Bureau of Public Roads, the Mass. Selectmen's Assoc., etc. from material developed in the study process.



PITTSFIELD
STUDY AREA

FITCHBURG-LEOMINSTER
STUDY AREA

LOWELL
STUDY AREA

CENTRAL MERRIMACK VALLEY
STUDY AREA
(Lawrence-Haverhill)

BOSTON METROPOLITAN
STUDY AREA

OLD COLONY (BROCKTON)
STUDY AREA

WORCESTER
STUDY AREA

SPRINGFIELD
STUDY AREA

SOUTHEASTERN MASS
STUDY AREA
(Fall River - New Bedford)

NANTUCKET
SOUND

URBAN TRANSPORTATION STUDY
AREAS WITHIN MASSACHUSETTS

APRIL 1969

DEPARTMENT OF PUBLIC WORKS

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

EASTERN MASSACHUSETTS REGIONAL PLANNING PROJECT

During fiscal 1968, the Eastern Massachusetts Regional Planning Project, P-34 was completed. The interagency Policy Committee held its final meeting on June 19, 1969.

The target major report, "Recommended Highway and Transit Plan", was accepted by the Project Technical and Policy Committees and was distributed to the communities and State legislators. The first presentation of the report was given to State and municipal officials on February 20, 1969 in the Auditorium at 100 Nashua Street. Subsequent presentations were given to smaller groups of communities at 10 subregional meetings held in March, April and May in order to record the feelings of the communities towards the plan and to develop a spirit of cooperation and communication between the Department and the communities.

The Recommended Plan network has been prepared and will be tested after the Inner Belt "Task A" Study is completed.

The continuing planning process is in the early stages of development in the Eastern Massachusetts Region. The Region has been divided into four sections: The Central Merrimack Valley Area, The Lowell Area, The Old Colony (Brockton) Area and The Boston Area. The smaller size will allow greater detail when working with each of the new study areas.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

Census Coding

Personnel from the Bureau of Transportation Planning and Development worked on preparing the address coding guide for the 1970 U.S. Census which will be conducted by mail. This work was very nearly complete at the end of June. The address coding guide will be used in updating the transportation study.

Other Bureau of Transportation Planning & Development Reports

A report "Airports and Air Transportation in Eastern Massachusetts" dealing with the future airport needs of the region was prepared and published by the Bureau of Transportation Planning and Development during the year.

Two other reports, "Parking: A Regional View" and "The Development of a Traffic Forecasting Model", were completed and published.

The Central Artery and Third Harbor Crossing Traffic Analysis Study was completed and is in the process of being distributed.

Inner Belt

The "Task A" portion of the Inner Belt Study is expected to be completed in October, 1969. The delay was principally caused by the failure of Cambridge to provide the community

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

planning assumptions when needed. The work has progressed to the trip distribution phase as of the end of June.

In addition to traffic assignments to the Inner Belt and Cambridge alternative networks, the "Task A" final report will contain an evaluation of these assignments and certain other criteria which have been agreed upon by the Department and the four communities. These criteria are: Economy, Safety, Quality of Transportation Service and System Considerations.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

CENTRAL MERRIMACK VALLEY TRANSPORTATION STUDY

LOWELL AREA TRANSPORTATION STUDY

OLD COLONY (BROCKTON) TRANSPORTATION STUDY

Each of these three areas are a division from the outer sections of the Eastern Massachusetts Regional Planning Project.

During the year negotiations have been carried on in each area to reorganize the Transportation Coordinating Committees to establish an effective working relationship between the Department, the local communities, the regional planning agencies and other interested state agencies for the purpose of carrying out the continuing cooperative transportation planning process.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

SOUTHEASTERN MASSACHUSETTS TRANSPORTATION STUDY

This study is comprised of two reports, one for the Fall River Area and one for the remainder of the Southeastern Massachusetts Area.

The study area covers four (4) cities and thirty (30) towns. The planning work was performed in cooperation with the Southeastern Massachusetts Regional Planning Commission, whose role aided in developing the social, economic and land use elements of the study.

During the past year, the review of both reports were completed with the formal presentation of the Fall River report being made on July 16, 1968 and the formal presentation of Southeastern Massachusetts report being made on March 6, 1969.

The highlights of both reports have been combined into one summary report and wide distribution has been made of these summaries.

Since the formal presentations of the report this office has gone forward in the Continuing Planning Process by drawing up an Operation Plan for approval by the local Transportation Coordinating Committee. This Operation Plan has been implemented in order to keep a check on certain growth indications to

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

ascertain if the forecasts made in the reports are following the predicted paths. This process will go on from year to year until a major update of the report is warranted which is usually 10 years after the completion of a report.

The past year has seen the reorganization of the Southeastern Massachusetts Regional Planning and Economic Development District by virtue of Chapter 663 Acts of 1968.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

SPRINGFIELD URBANIZED AREA TRANSPORTATION STUDY

The study area is comprised of five (5) cities and twenty-five (25) towns for a total of thirty (30) communities. The recommended transportation plan has been formulated in cooperation with the Lower Pioneer Valley Regional Planning District and coordinated with all other affected governmental agencies.

During the year, funds were provided for two (2) additional traffic assignments to alternative transportation systems for the forecast year 1990. The printing of the Final Report has been delayed pending analysis of these assignments and the development of a recommended transportation system. Volume I of the three volume report was completed in May, Volume III is at the printers at this time and Volume II is being rewritten because of the final recommended transportation plan. The presentation of the Final Report is scheduled for September 1969.

Discussion has continued on the operations plan for urban transportation planning in the Springfield area. To insure a balanced transportation system for the continued growth of the study area, the planning process operations plan will be coordinated with the Lower Pioneer Valley Regional Planning Commission.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

PITTSFIELD URBANIZED AREA TRANSPORTATION STUDY

The study area included one (1) city and three (3) towns for a total of four (4) communities. The Initial Study was completed in 1967 and the study area is in the continuing phase of urban transportation planning.

An operation plan has been formulated in a joint effort of the Department and the Transportation Coordinating Committee. The Transportation Coordinating Committee has actively participated in the collection of data necessary for the updating on an annual basis for the continuing planning process.

The annual review and report of the items necessary for updating in the Pittsfield Area should be available by September 1969.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

WORCESTER URBANIZED AREA TRANSPORTATION STUDY

This study comprises the City of Worcester and eleven (11) surrounding towns. The study is being performed in cooperation with the Central Massachusetts Regional Planning Commission and coordinated with all other affected governmental agencies.

During the past year, the consultant on the study has redrafted the final report, which is being reviewed prior to printing. A formal presentation of this report should be made in the Fall. As a result of Department reviews, the consultant has tested alternative locations of major connections to the highway system and has made a traffic assignment to the recommended highway network.

This report is a comprehensive study of transportation needs consistent with metropolitan goals for desirable development of land use.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

FITCHBURG - LEOMINSTER URBANIZED AREA TRANSPORTATION STUDY

The study area encompasses two (2) cities and two (2) towns for a total of four (4) communities. The Initial Study was completed in 1967 and the study area is in the continuing phase of urban transportation planning.

An Operations Plan has been formulated in a joint effort of the Department and the Transportation Coordinating Committee.

Staffing of the Montachusett Regional Planning Commission is presently being undertaken. When staffed, this agency will provide greater local technical assistance in the Continuing Transportation Planning Process.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

SPECIAL STUDIES SECTION

This section is responsible for analyzing New Transportation Needs 1970-1990. The scope of investigation covers airports, commuter rail transit, Northeast Corridor High Speed Ground Transportation, goods movement and several projects of miscellaneous character requiring immediate needs in the Department.

During the past year the section produced the following reports:

1. "Transportation Needs Eastern Massachusetts 1990 - Airports", publication #3079. It discusses the problems and progress in air travel and aviation and the needs in all modes of transportation to airports.
2. "A Recommended Guide for Land Use Planning at Expressway Interchanges in Massachusetts." This report discusses the means of eliminating indiscriminate development prejudicial to safety and value of these areas; and it discusses the role of local planners in identifying and controlling the optimum land uses.
3. A report on the potential traffic demand at Otis Airforce Base if converted to an Air Carrier Airport. This was prepared for the Governor's Advisory Committee on Transportation.
4. An analysis of truck volumes through Central Square, Cambridge. This report identified the volume of trucking with conclusions on the amount of avoidable truck travel if an Inner Belt were constructed.

The following projects are in the preparatory stage of development:

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

1. Goods Movement. An all modes commodity transport inventory. This year the emphasis is primarily on truck transport in the common carrier category. A directory of trucking concerns is under inventory, the end result of which will be a map of terminals by geographic distribution. Questionnaires on loads, trip frequencies origins & destinations are anticipated to provide data to formulate an image of the effect of this category of truck operations in commodity movement.
2. Logan Airport Travel Study. This study is in the negotiating stage. Its purpose is to inventory all travel into and out of Logan Airport by all modes. The Department is acting as Project Director for an interagency group consisting of MBTA, MPA, MTA and City of Boston. The Project is authorized under a Technical Studies Grant by the Urban Mass Transportation Administration, DOT.
3. As a member of the Metropolitan Airport Study team, the section is participating in the needs of a second air carrier airport and the needs of general aviation in the Boston hub airport region. Its primary function is to forecast the highway needs for selected airport alternatives.
4. Commuter rail transportation. Preliminary statistics and trends in defining the problems and recommending policies in this transportation mode were initiated.
5. Northeast Corridor High Speed Ground Transportation. Accumulation of program material was begun.

INTERSTATE TRANSPORTATION COORDINATING COMMITTEE

The two Tri-State Transportation Committees formally established by Memorandum of Understanding with adjacent state highway departments in 1965, met this year for their fourth annual meeting to discuss mutual problems, exchange of planning data and coordinate planning of transportation facilities crossing state boundaries. Connecticut was the host for the meeting of the Committee comprising Rhode Island, Connecticut and Massachusetts; the other meeting was held in Northfield for the Committee comprising Vermont, New Hampshire and Massachusetts with Vermont as the host.

G

LEGISLATION

The Department is recommending legislation this year for the following purposes.

1. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ESTABLISH SPEED ZONING ON ALL NUMBERED ROUTES.

Since 1948 the Department and municipalities have been authorized to establish speed zones on ways under their respective controls. For some time now, breaks in State Highways on numbered routes have been indicated as confusing to vehicle operators and more particularly so where the breaks have not been speed zoned by local officials. This authorization for the Department to speed zone all numbered routes will not only be helpful to the motorists but will provide for continuity as well as uniformity in controls along our numbered route system.

2. AN ACT AUTHORIZING THE DEPARTMENT TO ACQUIRE LAND FOR THE PARKING OF VEHICLES.

Adjacent to the Department Motor Pool on Nashua Street is a portion of land and a dead end street (Minot Street). The land would accommodate approximately fifty to sixty self-parked vehicles. The accommodation is sorely needed for Department Motor Pool activities. The authorization also covers a parcel of land and a building housing ice making equipment to be abandoned.

3. AN ACT AUTHORIZING THE CLOSING OF STATE HIGHWAYS OR THE EXCLUSION OF VEHICLES THEREFROM, FOR PUBLIC SAFETY AND CONVENIENCE.

From time to time, because of peak hour traffic volumes

LEG ISLATION

and highway maintenance problems, it becomes advisable for safety and convenience of the public, to close portions of state highways. Such an authorization would allow maintenance operations to be completed in minimum time requirements.

4. AN ACT RELATIVE TO THE TRANSFER OF LAND ADJACENT TO LIMITED ACCESS HIGHWAYS.

Chapter 518 of the Acts of 1957 authorized the Department to transfer portions of State Highways to the Metropolitan District Commission but did not stipulate that portions of highways transferred would continue as limited access as required by Federal Standards.

5. AN ACT PROVIDING FOR DRIVING A VEHICLE DURING INCLEMENT WEATHER CONDITIONS.

At the present time, Massachusetts Laws do not contain sufficient requirements governing the operation of vehicles on our arterial highway system during inclement weather conditions. This Bill would provide for the official declaration of a weather emergency period and would require special traction precautions during such period.

6. AN ACT AUTHORIZING THE CITY OF BOSTON TO CONVEY TO THE DEPARTMENT OF PUBLIC WORKS LAND IN SAID CITY.

Since the construction of the Boston Central Artery (John F. Fitzgerald Expressway) the Department with the consent of the city of Boston has been using as parking areas two small parcels of land remaining from highway takings of Nashua Street and Lomasney Park near Leverett Circle. The Department intended

LEG ISLATION

to replace the park area until the city of Boston indicated that there was no practical need for a park in this area.

7. AN ACT PROVIDING FOR A MAXIMUM CHARGE ALLOWABLE FOR THE TOWING OF VEHICLES DURING SNOW EMERGENCIES.

This Bill would clarify the subject of a maximum allowable charge to be made in the removal of vehicles from highways during snow removal operations on State Highways by setting a maximum limit of twenty five dollars excluding storage fees.

8. AN ACT REIATIVE TO THE DUTIES AND SALARY OF THE SECRETARY TO THE COMMISSION OF THE MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS.

The purpose of this act is to place the position of Secretary to the Public Works Commission in the classified salary schedule established under section forty-six of chapter thirty of the General Laws.

9. AN ACT RELATIVE TO THE DUTIES AND SALARY OF THE HEARING EXAMINER OF THE MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS.

This bill provides for an increase in the responsibilities and duties of the Department Hearings Examiner and will place the position in the classified salary schedule established under section forty-six of chapter thirty of the General Laws.

10. AN ACT RELATIVE TO THE BONDING PROVISION REQUIRED FOR THE EXCAVATION OF PUBLIC WAYS.

The present bonding requirements of not less than

LEGISLATION

\$500.00 nor more than \$10,000.00 is not sufficient to guarantee satisfactory performance by contractors. The increase to \$2,000.00 and \$25,000.00 limits will provide more reasonable surety bonds to protect the public interests in contractual work.

11. AN ACT GOVERNING APPOINTMENT TO CERTAIN SUPERVISORY ENGINEERING POSITIONS IN THE DEPARTMENT OF PUBLIC WORKS.

This bill will authorize the establishment of a pool of top echelon engineering personnel in the Department and the appointment from that pool of persons of engineering ability to fill the supervisory positions within the Department.

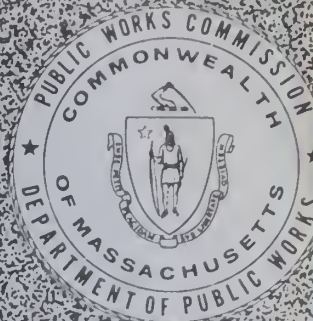
12. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ASSIGN THE POLICING OF PORTIONS OF STATE HIGHWAYS TO THE METROPOLITAN DISTRICT COMMISSION.

In the construction of the Interstate and Defense Highway System in several instances it has been necessary for the Department to acquire M.D.C. roadways to re-design them or re-locate them where they abut the Interstate Highway. To provide continuity of police functions it is desirable that the M.D.C. continue to police the highway. Under the provisions of this Bill the Department would in agreement with the M.D.C., vote to assign the policing to that agency.

MASS. - Public Works Dept. of

TC 20.1:969-970

July 1, 1969 - June 30, 1970



annual report

**MASSACHUSETTS
DEPARTMENT
OF PUBLIC WORKS**

Government Documents
Collection

DEC 17 1970

University of Massachusetts

EDWARD J. RIBBS
COMMISSIONER

ROBERT S. FOSTER
CHARLES A. BISBEE JR.

PETER E. DONADIO

JOHN P. KING

ASSOCIATE COMMISSIONERS

◀ **PUBLIC WORKS COMMISSION**



The Commonwealth of Massachusetts

Department of Public Works

Office of the Commissioner

100 Nashua Street, Boston 02114

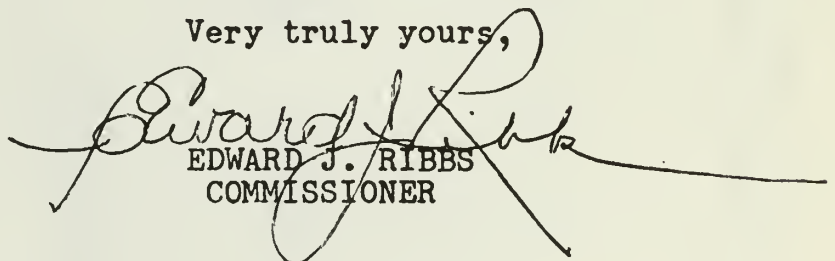
December 1, 1970

His Excellency, Governor Francis W. Sargent
and the Great and General Court of the
Commonwealth of Massachusetts:

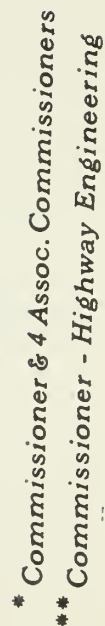
Gentlemen:

In accordance with Section 5 of Chapter 16,
as amended by Chapter 821 of the Acts of 1963, I
herewith submit the annual report of the
Massachusetts Department of Public Works for the
fiscal year ending June 30, 1970.

Very truly yours,


EDWARD J. RIBBS
COMMISSIONER

ORGANIZATION CHART



✻
✻

INDEX

- A. Division of Administrative Service
- B. Highway Engineering
 - 1. Highway Design Division
 - 2. Right of Way Bureau
 - 3. Bridge Section
 - 4. Traffic Engineering Section
 - 5. State Aid Section
 - 6. Research and Materials Section
- C. Highway Construction
 - 1. Construction Section
 - 2. Contract Engineer Section
 - 3. Final Review Section
 - 4. Procedures and Records Section
- D. Highway Maintenance Section
 - 1. Maintenance Section
- E. Division of Waterways
 - 1. Division of Waterways
- F. Bureau of Transportation Planning and Development
- G. Bureau of Solid Waste Disposal
- H. Legislation

A

DIVISION OF ADMINISTRATIVE SERVICES

The major functional activities of the Division of Administrative Services (approximately 324 employees) are as follows:

1. Processing, reviewing, recording and reporting all financial transactions of the Department.
2. Processing and recording of all personnel actions.
3. Coordinating the preparation and administration of the Department budget.
4. General Services (Print Shop, Blue Print Shop, Micro-filming, Photography, Xeroxing, Mail Room and other general services to the Department.)
5. Establishing and revising administrative procedures and systems.
6. Accident prevention and safety programs.
7. General secretarial activities for the Department.
8. Supervision of:
 - a. Public Works Building Security.
 - b. Public Works Building Operation and Maintenance.
 - c. Motor Pool Activities.

Appendix A presents organization chart and statement of responsibility for the Division and the sections thereof.

During Fiscal 1970, the Division continued its long-range effort to strengthen and streamline all functional operations, particularly in the general administrative and financial management areas.

APPENDIX A

Organization Chart

Statement of Responsibility

DIVISION OF ADMINISTRATIVE SERVICES

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS
STANDARD OPERATING PROCEDURES

S.O.P. No. ADM-01-35-1-000

PAGE 1 OF 1

SUBJECT DIVISION OF ADMINISTRATIVE SERVICES-ORGANIZATION
CHART

DISTRIBUTION
A

EFFECTIVE

ISSUED

SUPERSEDES PAGE 1 OF 1

APPROVED

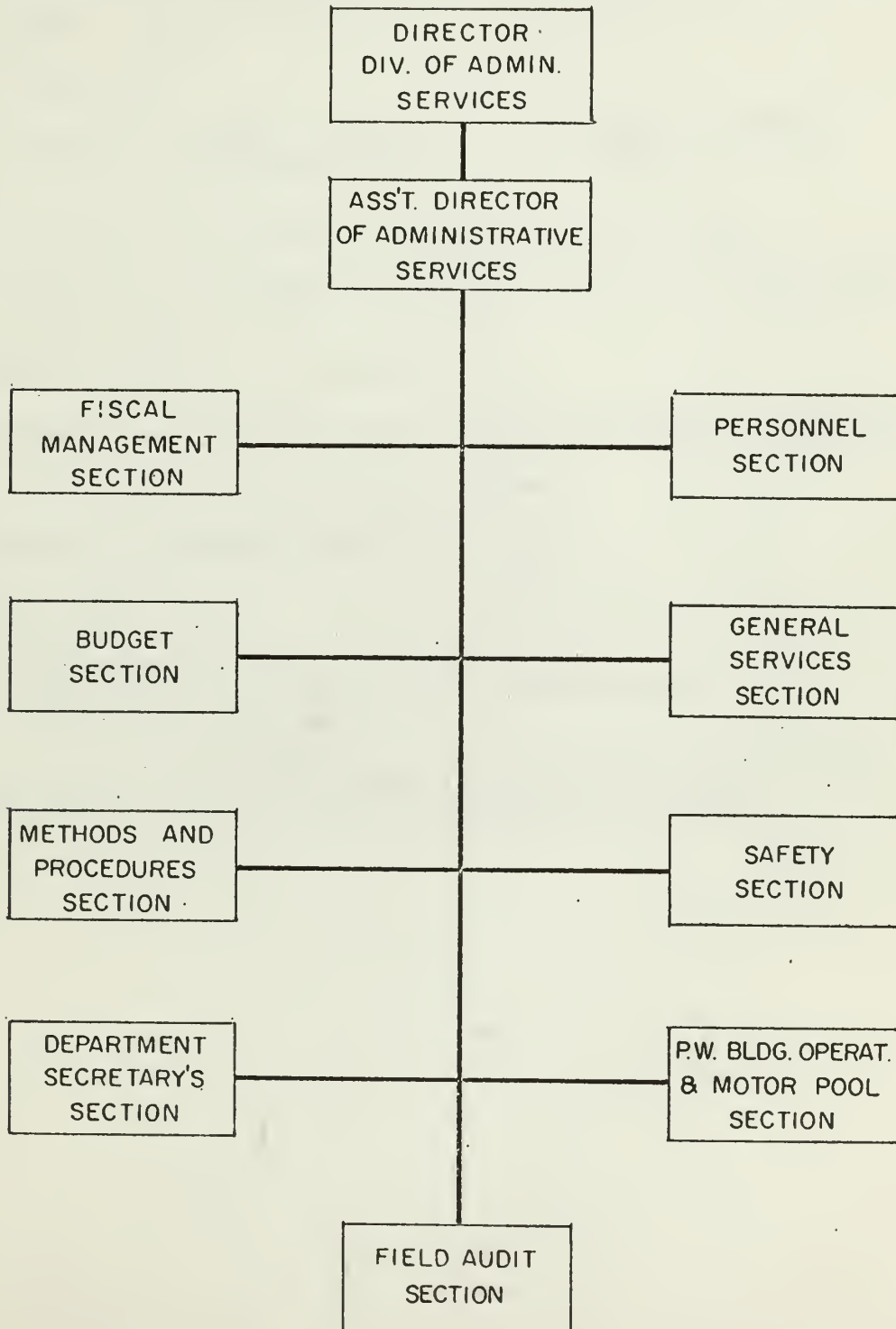
March 15, 1969

March 15, 1969

S.O.P. No. ADM-01-35-1-000

EFFECTIVE July 1, 1967

Seward J. Linn



COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS STANDARD OPERATING PROCEDURES			S.O.P. No. ADM-01-36-1-000	
			PAGE 1 OF 1	
SUBJECT DIVISION OF ADMINISTRATIVE SERVICES- STATEMENT OF RESPONSIBILITIES			DISTRIBUTION A	
EFFECTIVE	ISSUED	SUPERSEDES	PAGE 1 OF 1	APPROVED
March 15, 1969	March 15, 1969	S.O.P. No. ADM-01-36-1-000 EFFECTIVE July 1, 1967		<i>Edward J. Lio</i>

SUMMARY STATEMENT OF RESPONSIBILITIES

Responsible for the administrative and financial activities of the Department.

MAJOR ACTIVITIES

1. Processing, reviewing, recording and reporting all financial transactions of the Department.
2. Processing and recording all personnel actions.
3. Coordinating the preparation and administration of the Department budget.
4. General Services.
5. Establishing and revising administrative procedures and systems.
6. Accident prevention and safety programs.
7. General secretarial activities.
8. Supervision of:
 - a. Public Works Building Security
 - b. Public Works Building Operation and Maintenance
 - c. Motor Pool Activities.
9. Auditing of utility company, railroad and consultant contract billings to ascertain their correctness and propriety.

B

HIGHWAY DESIGN DIVISION

SURVEYS, PLANS, ESTIMATES & FINAL SURVEYS

During the period July 1, 1969 to June 30, 1970, the Boston Metropolitan Area Design Section had under contract final design projects for approximately 13.8 miles of Interstate Highways broken down as follows: .

Interstate 95: 10.4 Miles	Canton (Rte. 28)-Boston(Mass. Ave.)
Interstate 93: 1.9 Miles	Medford-Somerville-Boston
Interstate 695: 0.7 Miles	Boston (Fenway Tunnel)
Interstate 695: 0.8 Miles	Boston (City Sq.)-Somerville (Joy St.)

During this period, plans were completed and construction contracts awarded for two (2) sections of Interstate 93 in Medford-Somerville-Boston valued at \$31,912,718.80 and a section of Interstate 695 in Boston-Somerville valued at \$12,467,274.00. Construction is now underway on all sections of roadway required to bring Interstate 93 into the Fitzgerald Expressway (City Square, Charlestown).

All other design activities of this Section, with the exception of Interstate 695, Boston-Somerville (Joy Street). were suspended effective April 1, 1970 by a moratorium imposed by Governor Sargent.

HIGHWAY DESIGN DIVISIONSURVEYS, PLANS, ESTIMATES & FINAL SURVEYS

During the fiscal year ending June 30, 1970 preliminary surveys, plans, estimates and final surveys were made as follows:

	<u>Cities</u>	<u>Towns</u>	<u>Miles</u>
<u>FOR STATE HIGHWAY CONSTRUCTION</u>			
Preliminary Surveys	9	27	80.7
Preliminary Plans	4	24	35.0
Preliminary Estimates	11	29	33.1
Final Surveys	5	9	32.6

FOR STATE HIGHWAY RECONSTRUCTION

Preliminary Surveys	2	17	11.2
Preliminary Plans	5	13	11.6
Preliminary Estimates	3	18	26.0
Final Surveys	0	0	0

FOR CHAPTER 81

Preliminary Surveys	0	1	0.4
Preliminary Plans	0	0	0
Preliminary Estimates	0	172	9254.3
Final Surveys	0	0	0

FOR CHAPTER 90

(Advertised & Unit Price)

Preliminary Surveys	13	35	45.3
Preliminary Plans	13	28	30.4
Preliminary Estimates	16	28	36.7
Final Surveys	6	3	9.7

FOR CHAPTER 90 CONSTRUCTION

(Force account)

Preliminary Surveys	0	84	64.0
Preliminary Plans	3	86	62.5

(Cont.)

HIGHWAY DESIGN DIVISIONFOR CHAPTER 90 CONSTRUCTION (cont.)
(Force Account)

	<u>Cities</u>	<u>Towns</u>	<u>Miles</u>
Preliminary Estimates	6	185	189.1
Final Surveys	0	0	0

FOR CHAPTER 90 (Maintenance)

Preliminary Surveys	0	2	4.1
Preliminary Plans	1	4	26.3
Preliminary Estimates	3	231	1063.9
Final Surveys	0	0	0

FOR ROADSIDE DEVELOPMENT

Preliminary Surveys	0	1	0.4
Preliminary Plans	5	9	24.9
Preliminary Estimates	5	9	24.9
Final Surveys	0	0	0

FOR ACCIDENT PRONE

Preliminary Surveys	5	31	19.0
Preliminary Plans	12	39	38.9
Preliminary Estimates	18	72	135.6
Final Surveys	0	2	1.0

FOR RECONSTRUCTION SUB-STANDARD BRIDGES

Preliminary Surveys	2	14	4.1
Preliminary Plans	1	10	2.2
Preliminary Estimates	4	9	2.5
Final Surveys	1	2	0.6

NOTE:

No Landscape & Scenic Enhancement Projects

No Control of Junk Yards Projects

HIGHWAY DESIGN DIVISION

AERIAL SURVEYS

Reconnaissance - Scale: 1"-200'

Square Miles

Route 140	Gardner-Westminster	5.44
Route 140	Princeton-Sterling-West Boylston	11.55
Route 140	Taunton-Raynham	3.21
Route 140	Foxborough-Mansfield-Raynham	7.92
Route 31	Fitchburg-Westminster	8.12
Route 8	Dalton-Hinsdale	8.37
Route 27	East Bridgewater-Hanson	1.61
Routes 14+139	Duxbury-Marshfield	2.26
Route 3	Burlington-to Lowell	5.80
Route 128	Wakefield to Weston	9.00
Washington Mountain		
Road	Dalton-Pittsfield-Washington	<u>2.56</u>
Total		65.84

Preliminary Plans, Profiles, Construction Tracings, and Cross-

Sections - Scale: 1"+40'

Linear Miles

Route 7	Lenox-Pittsfield	4.99
Route 20	Hancock-Pittsfield	6.45
Route 140	Foxborough-Mansfield-Norton	5.36
Winthrop Connector	Winthrop	1.66
North Pleasant St.	Amherst-Hadley	<u>3.85</u>
Total		22.31

HIGHWAY DESIGN DIVISION

LENGTHS OF STATE HIGHWAY LAID OUT FROM JULY 1, 1969 to
JUNE 30, 1970

21.075 additional miles of State highway were laid out in 4 Cities and 8 Towns.

38 State highway alterations not involving additional mileage were made in 10 Cities and 23 Towns.

1 State highway alteration involving 0.050 additional miles was laid out in 1 Town.

5 Sections of State highway were Discontinued in 5 Towns for a total of 8.699 miles.

2 City layouts in 2 Cities were prepared.

2 Town layouts in 2 Towns were prepared.

54 Advance Takings in 5 Cities and 7 Towns were prepared for proposed State highway locations, 33 being taken in the City of Boston.

1 Section of State highway was abandoned in 1 Town for a total of 0.152 miles.

1 Recreation Area was taken in 1 Town.

1 Maintenance Area was taken in 1 Town.

1 Maintenance Area was conveyed to a Town.

1 Conveyance to a Private Owner.

The total length of State highway location on June 30, 1970 was 2,647.243 miles.

HIGHWAY DESIGN DIVISION

GEODETTIC SURVEYS

Field Work

TRIANGULATION	20 Sq. Miles
TRIANGULATION RECONNAISSANCE	20 Sq. Miles
SECOND ORDER TRAVERSES	70 Miles
LEVEL LINES	70 Miles
GEODETTIC MONUMENTS RECOVERED	725
NEW GEODETTIC MONUMENTS ESTABLISHED	205
GEODTIMETER MEASUREMENTS FOR DISTRICTS	450 Miles

OFFICE COMPUTATIONS

TRIANGULATION NETS COMPUTED AND PLOTTED	20 Sq. Miles
SECOND ORDER TRAVERSES COMPUTED AND PLOTTED	30 Miles
BASELINE TRAVERSES COMPUTED AND PLOTTED	40 Miles
LEVEL LINES COMPUTED	30 Miles
FILE CARDS RETYPED AND DRAFTED	1,500
TOWN CORNERS RE-COMPUTED	200
ADJUSTED HIGHWAY TRAVERSES COMPUTED AND PLOTTED	83 Miles

MISCELLANEOUS

DRAFTING PLANS OF GEODETTIC AND BASELINES TRAVERSES	
PLOTTING GEODETTIC AND PRIVATE AGENCIES CONTROL POINTS ON TOPOGRAPHICAL SHEETS	
KEEPING TOWN BOUNDARY ATLASES UP TO DATE.	
COMPUTATION OF GRID COORDINATES OF TOWN BOUNDARY SURVEY TRIANGULATION STATION	1501

(cont.)

HIGHWAY DESIGN DIVISION

MISCELLANEOUS (cont.)

CONVERSION OF GEODETIC SURVEY PROGRAMS

FROM FORTRAN II (IBM 1620) TO FORTRAN

IV (IBM 360)

35

ISSUANCE OF GEODETIC CONTROL DATA TO STATE

AND PRIVATE AGENCIES

RIGHT OF WAY BUREAU

Right of Way activities are peculiarly sensitive to major public policy changes, and fiscal 1970 has brought with it several critical shifts of policy which have affected the activity of the Right of Way Bureau. Land acquisition has a direct and immediate impact upon the public and is at best a friction point between people and their government. Consequently, new directions in program usually are reflected in this activity area first.

Under strong pressure from the FHWA, and in response to its own heavy commitment to the program, the Right of Way Bureau has made a major effort in the area of relocation assistance particularly in the processing of relocation payments. During the fiscal year 2663 claims were processed compared to 1009 in the previous year. The total amount of \$3,086,509 in relocation claims was processed by the Right of Way Bureau during fiscal 1970--compared to \$814,430 for the previous fiscal year. This result has been achieved with no increase in Bureau personnel. In addition to residential relocation moving claims and dislocation allowance claims--three new forms of benefits available under the 1968 Federal Highway Act were included. One hundred and eighty-seven replacement housing allowance claims, totalling \$542,269.97 (average \$2,899.80), 766 rental supplement claims, totalling \$685,168.88 (average \$894.47) and 158 business relocation cost claims, totalling \$1,690,342.33 (average \$10,698.36), were processed.

RIGHT OF WAY BUREAU

It can safely be said that full benefits under the Federal Highway Act are now a reality--and the relocation effort, accompanied by the necessity of major policy and procedural revisions required by the program, the development of acceptable methods of claim review, the creation of the Relocation Claim Review Panel and the establishment of full appeal procedures for claimants, has been one of the key developments of the year.

In other relocation efforts, land takings affected 355 families and 84 businesses. During the year, 423 families were relocated and 101 businesses moved to new quarters. Business liquidation claims for 40 businesses were proceeded--also a new benefit under the 1968 Act. It should be noted that the vast majority of liquidating businesses were barrooms where home problems were involved. It should also be noted that there has been a net gain in employment by businesses relocated.

Further, relocation services rendered during the year by contract agents in Boston and Fall River, the two major areas of urban impact, reflected a fiscal outlay of \$289,622.12.

New public concern for the preservation of conservation, recreation, park and other types of public land, expressed in legislation as well as in judicial decision at both state and national levels, has introduced important changes in the process of land acquisition. Highway layouts which by their very nature involve strip takings through or alongside many such areas now require special acquisition procedures.

RIGHT OF WAY BUREAU

Action by the State Legislature and special approvals by the Office of the Secretary of Transportation pursuant to provisions of what is known as Section 4F of the Federal Highway Act are required before acquisition can occur.

These procedures, which result in lengthy delay, are required in each case even though the actual taking of public lands only affects small bits and pieces of public land involved. As a result, many miles of highway location are affected by such small fragments. The cumbersome procedures are adversely affecting the orderly acquisition process and acquisition programing is severely curtailed. This situation will seriously affect the Bureau's operation in the next fiscal year, unless means can be found to expedite the decision making process or of developing more realistic requirements to cover the practicality of highway takings which have only a minor effect upon the specific public lands involved.

The announcement by the Governor of a moratorium upon certain urban highway projects--particularly upon the Southwest Expressway in Boston has had a sweeping effect upon right of way production for the year. Originally scheduled as the major effort of the Bureau for fiscal 1970, the Southwest Corridor program was effectively terminated in February of this year. As the government enters into the restudy and reanalysis of transportation needs in the Corridor a new range of problems has been encountered. Not only has the introduction of the new element of uncertainty affected the considerations of those families and business located in

RIGHT OF WAY BUREAU

the Corridor rendering relocation efforts more complex, but the curtailment of demolition has given rise to property management considerations which are different in kind and nature to those previously encountered. The stated goal of the moratorium policy which aims at preservation, rehabilitation and use during the restudy period of vacated structures in the Corridor to alleviate the critical housing shortage in the City of Boston is a major policy change with extensive impact upon the Right of Way mission. The Bureau has been working extensively with the Governor's Southwest Corridor Management Committee to provide solutions to the many problems which such a new program poses, and which will be consistent with the desires of those communities through which the Corridor extends.

It is clear that the developments of new policy during fiscal 1970 will necessitate program change. The problems of delay will in all likelihood make it necessary to alter programing from one of acquisition of complete sections of highway layout to an accelerated program of spot acquisition in which parcels in a corridor are acquired on a piecemeal basis keyed to a timing schedule which reflects the desires of property owners. It is equally clear that the problems of maintaining both land and structures so acquired will have to change. Especially in areas where there is a call for structural use rather than demolition, in areas where those handmaidens of public acquisition, fire and vandalism

RIGHT OF WAY BUREAU

stalk all buildings, programs of safe reuse have to be established which will not create lineal ghettos in involved corridors, with their inevitable debilitating effect upon the surrounding communities. Also, methods of maintenance and temporary reuse of open land must be devised which will overcome the problem of massive illegal dumping and overgrowth to allow the State to present a proper posture as a good neighbor to abutting property owners.

21.075 additional miles of State highway were laid out in 4 cities and 8 towns during fiscal 1970. Thirty-eight State highway alterations were made in 10 cities and 23 towns involving no additional mileage with one alteration involving .05 additional miles. Five sections of State highway, totalling 8.699 miles, were discontinued in 5 towns. Two city layouts and 2 town layouts were prepared. Fifty-four advance takings in 5 cities and 7 towns were prepared, 33 being in the City of Boston. One section of .152 miles of State highway was abandoned in one town. One recreation area in one town was acquired. One maintenance area in one town was taken, and one maintenance area was conveyed to a town. The total length of State highway location on June 30, 1970 was 2,647.243 miles.

Property management activities of the Bureau were extensive during fiscal 1970 as can be seen from the following figures:

RIGHT OF WAY BUREAU

PROPERTY MANAGEMENT

During the year fiscal 1970, rentals under the property Management Section of the Right of Way Bureau grossed \$194,238.50, with a net income after expenses of \$71,350.09.

Sales of principal structures and improvements yielded \$50,137.00 and sales of land brought \$21,707.50. Parking areas leases produced \$51,660.00.

Additional leases netted \$231,196.67, bringing the total net receipts to \$426,051.26 for fiscal 1970.

During the year, 302 structures were acquired, of which 240 were residential and 62 were commercial.*

During the same year, 235 were vacated and 218 structures were released for demolition.**

*A total decrease of 47.2% over fiscal 1969, with a decrease of 41.2% in residential and a 61.7% decrease in commercial buildings.

**A decrease of 45.98% vacated over fiscal 1969 and a 53.2% decrease for demolition.

	Comparison for fiscal <u>1969</u>	<u>1970</u>
Grossed rental income	\$135,178.96	\$194,238.50
Net income after expenses	62,558.73	71,350.90
Sales of structures	53,328.16	50,137.00
Sales of land	300,060.00*	21,707.50
Parking area leases	51,162.00	51,660.00
Additional leases	<u>209,464.68</u>	<u>231,196.67</u>
Total Net Income	<u>\$676,573.57</u>	<u>\$426,051.26</u>

RIGHT OF WAY BUREAU

*Land sale of \$282,000.00 to Federal Government
for land in Worcester for Post Office site.

The Bureau's training program for its career employees reached new heights during fiscal 1970. One hundred and seventy-two employees participated in the following educational programs during the year:

(1) Thirty attended Real Estate Course 1, arranged through the Boston College Bureau of Public Affairs, conducted between September 29, 1969 and October 10, 1969.

(2) Thirty attended MAI Course I in Appraising held at Weston College, October 14-25, 1969.

(3) Thirty attended the New England Law Institute Seminar on Continuing Education on Eminent Domain Law on January 31, 1970.

(4) Twenty-two attended MAI Course 2, in Appraising, held at Worcester Polytechnical Institute, April 18 - June 27th 1970.

(5) Sixty attended a special Department of Public Works Course IV on Condemnation conducted by MAI instructors held at Boston, June 22-24, 1970.

In connection with the training effort it should be noted that for the first time its program was extended to include staff of the Attorney General's Eminent Domain division. This feature represents a significant step forward toward the understanding that eminent domain activity is an intergrated

RIGHT OF WAY BUREAU

process in which major benefits to the Commonwealth can be achieved only by strong interagency coordination.

The Bureau's Attorney General Liaison Section which coordinates the efforts of the Department and the Eminent Domain division of the Attorney General's Office had a particularly busy year in the preparation of land damage cases. The number of cases increased 20% with the cost increasing 23%. Both the number and the cost reflect the large number of urban takings made in recent years which include expensive industrial and commercial properties which are subject to more frequent litigation.

Over all, 1136 parcels of land were acquired for highway purposes during fiscal 1970, with a total of \$8,123,408 voted in awards for land takings. In addition, the Attorney General's Office settled 264 cases for an additional \$8,838,644, bringing the total land acquisition cost for the fiscal year to \$16,962,052. Attorney General's settlements which were 27.9% above Department figures continue to reflect a far better level of accomplishment that prevails nationally.

Six hundred and ninety-eight staff and 287 fee appraisals were completed during fiscal 1970. The Appraisal Division Section reviewed a total of 905 appraisals both staff and fee.

The Massachusetts Real Estate Review Board took action on 161 appraisals.

RIGHT OF WAY BUREAU

The negotiation Section made offers in 678 cases and settled 137 cases. In addition, new duties of preliminary interviewing were exercised by the negotiation team. Negotiators also rendered assistance to the Land Damage Payment Section which processed 804 payments to property owners during the fiscal year.

The Bureau's FHWA Liaison Section was especially active during fiscal 1970. Reclaim vouchers under the Audit Deduction Program were submitted in the amount of \$1,189,176. In addition, claims under the Meredith & Grew Contract No. 9107 in the amount of \$1,528,867.37 were resolved in favor of the Commonwealth. Ineligibility findings by Public Roads in the amount of \$576,621.00 were successfully resolved in the Department's favor. Dozens of meetings were held with FHWA throughout the year because of the new and more demanding compliance requirements established by that agency in the field of real estate appraisal and appraisal review. In like manner, the heavy requirements of the Relocation Assistance and Relocation Payments program mentioned earlier in this report required almost continuous DPW-FHWA conference exchange.

Finally, the Advance Acquisition Section of the Bureau once again experienced an expansion of work during the year. In addition to regular duties the Advance Acquisition Section conducted studies for the proposed second airport in four areas: the Mansfield-Sharon-Easton Site, Dover, Plymouth-Carver, and Hopkinton-Holliston-Ashland Site. The study

RIGHT OF WAY BUREAU

involved over 50,000 acres of land and over 2300 dwellings.

This section also had the responsibility of the remaining Interstate study on a parcel by parcel basis, including the proposed third tunnel under Boston Harbor.

More than 170 requests for hardship takings have been processed during this fiscal year, and the volume of work now in process has been increased dramatically. Two advance acquisitions of commercial sites were made for the purpose of protecting highway location from heavy capital improvements with an estimated savings to the taxpayer in excess of \$250,000. The next fiscal year will also reflect a heavy increase in this area of work.

BRIDGE SECTION

During the period from July 1, 1969 to June 30, 1970, the Department advertised for bids for construction forty-two (42) bridges and culverts, one demolition of an existing structure and one alteration of an existing structure. These structures were either designed by or processed through the Department's Bridge Section.

These structures are located in twenty cities and towns throughout the Commonwealth and cost approximately \$11,000,000.

The structures advertised were as follows: thirteen (13) were for Route 6 in Dennis, Wareham and Yarmouth, eight (8) were for Route 140 in New Bedford and Taunton, six (6) were for Interstate Route 86 in Sturbridge, three (3) were for Interstate Route 95 in Danvers and the remainder were for various State Highway and Chapter 90 projects.

Twenty-two (22) boring contracts were advertised during this period at a cost of approximately \$400,000.

The Department has made preliminary studies and has initiated work on bridges at the following locations:

Interstate Route 391 in Chicopee

Interstate Route 95 in Boxford, Georgetown, Middleton
and Newburyport

Route 52 in Auburn and Oxford

Route 44 in Carver, Kingston and Plymouth

Route 2 in Athol, Orange and Wendell

Beverly-Salem Connector

Salisbury Connector in Amesbury-Salisbury

Interstate Route 95 in Peabody

BRIDGE SECTION

The Department has assigned structural steel fabrication inspection to two testing agencies amounting to approximately 28,000 tons. Other affiliated work includes the inspection of steel fabrication plants and steel mills both in this country and Canada. In addition to the above, we are utilizing our "Standards for Ultrasonic Inspection of Structural Welds", which were developed by the Department over the last two years. This specification has been requested by the Library of Congress, Massachusetts Institute of Technology, U. S. Air Force and others.

The Department continues to receive at an expanded rate numerous requests from Utility Companies to place utilities on existing structures. Also, requests are received for permits to move overweight loads over bridges. In every case all bridges involved must be analyzed to insure that the safety of the travelling public is not jeopardized by permits issued by the Department.

As authorized by Chapter 81 of the General Laws, the Department provides advice relating to public ways to cities and towns. Under this authorization, the Department has inspected numerous structures and made recommendations concerning their safety or suggested repairs. It is interesting to note that this service has been provided by this Department to municipalities for years and that this is the same area that the Federal Government has only recently evidenced an interest in, as is demonstrated by the wording of the Federal Aid Highway Act of 1968.

BRIDGE SECTION

Bridge Section forces finalized standards for overhead directional signs in order to receive approval of the Federal Highway Administration. We have also been involved with the design, checking design of, and checking shop drawings for various Traffic Sign Contracts. The Traffic Signs that were checked in this Section cost over \$2,700,000.

The Department advertised and began construction of a bridge which is almost unique in its make up and configuration. The bridge carries Ramp P over Interstate Route 291 in Springfield. It is a two-span bridge supported on horizontally curved steel box girders with a center line radius of approximately 160 feet. Because this is such a new type of construction, the structure has received and is receiving some national interest. In fact, there is a distinct possibility that the structure will be statically and dynamically load tested to determine loading response and provide benefits in the design and analysis of future structures of similar configuration.

TRAFFIC ENGINEERING SECTION

The Traffic Engineering Section comprised of the following Units:

1. Administration and Clerical
2. Traffic Operations and Safety
 - a. Accident Analysis and Records
 - b. Speed Zoning
 - c. Regulations
 - d. Safety Improvements
3. Signs and Pavement Markings
4. Traffic Signals and Highway Lighting

This Section has been actively involved in the Accelerated Highway Program on all levels including Interstate, State and Municipal roadways.

The following individual Unit reports reflect the quantity and type of work done throughout the fiscal year:

Chapters 519, 616 and 862, Acts of 1967, were administered by the Section along with review and design in the areas of geometrics, signing, pavement marking, traffic safety devices, highway lighting, speed zoning, traffic control agreements and accident study and research.

During the fiscal year the Section has supervised the Department's program of updating traffic control devices in efforts to achieve conformance with the National Joint Manual on Uniform Traffic Control Devices for Streets and Highways.

The Section has also been continually reviewing and updating the Massachusetts Manual on Uniform Traffic Control Devices and disseminating this information throughout the Commonwealth in an effort to bring all municipalities into conformance.

TRAFFIC ENGINEERING SECTION

Progress reports concerning Chapters 519 and 862, Acts of 1967 are included in the enclosed Unit reports.

Chapter 616, Section 6, Acts of 1967, a bill providing 100% reimbursement to cities and towns for the installation of standard school zones as approved by the Department, was continued this fiscal year.

Of approximately 97 permits issued to 32 cities and towns, about 65 school zones have been processed to encumber to date a total of approximately \$195,500.

During the previous fiscal year the Traffic Engineering Section was relieved of the administrative responsibility regarding the Topics Program. However, the Section is still very actively involved in the design, review and assistance portions of this program.

In addition to activities related to new highway construction, the Traffic Engineering Section has expended considerable effort in the correction of accident-prone locations on existing highways by redesign and other means of traffic control.

The Traffic Engineering Section has continued its initiation of projects in the Safety Spot Improvement Program based on preliminary recommendations from the various Districts. Pertinent traffic data, including accident history records, traffic volume counts, engineering judgement and preliminary estimates of costs, were correlated to provide the justification for the improvement and the assignment of priority. This data provides a basis for further evaluation and actual programming for construction. This basic data is also necessary to satisfy the requirements of the Bureau of Public Roads for Federal participation in 50% reimbursement

TRAFFIC ENGINEERING SECTION

of ABC funds expended. The Traffic Engineering Section has proposed projects for corrective safety measures through 1971.

In order to accomplish all of this work the Clerical Unit processed approximately 4600 letters and 3020 permits and regulations.

ACCIDENT ANALYSIS

During the 1970 fiscal year the Department's Traffic Records Project, as developed by this Section, became operational. Now, through the technology of data processing, the Department has the capability to locate accidents which have occurred since June 1, 1969 to the present on any specific section of the State Highway System.

Source Data for the system is supplied by the Registry of Motor Vehicles through their Traffic Accident Center. Location of accidents on the State Highway System is accomplished by the use of coding maps which have been developed through the cooperative effort of this Department and the Registry of Motor Vehicles. The coding maps allow an accident to be located and coordinated on an x-y Grid System with an accuracy of 100'±.

Currently, this system, which is generating reports to District and main office personnel, locates accidents on the state highway system by route number and municipality. Development and refinement of the accident system was accomplished "in house" by the Department's Electronic Data Processing Section.

Additional data programs which have not been fully tested and developed, will give the Department through automation the capability to locate not only areas in which there is a high

TRAFFIC ENGINEERING SECTION

ACCIDENT ANALYSIS (Cont'd)

incident of accidents but also locations in which there is a potentially high accident rate.

As in the past, a major effort has been given to fatal accidents. Daily checks are made with the Registry of Motor Vehicles. District personnel are then alerted by phone to gather specific information regarding fatal accidents. In conjunction with the Department's continual investigation of the causes, effects and remedial measures which might be taken with respect to fatal accidents, the Department collated data for the publication of the forth annual report, "State Highway Fatal Motor Vehicle Accidents - 1969". Information was compiled, assembled and published by the Accident Records Unit of the Traffic Engineering Section.

During the fiscal period the Department continued its participation in the Boston University Accident Research Project. This is a Multi-Disciplinary Project investigating motor vehicle fatal accidents in general. Forty-one accidents, forty of which were fatal, were investigated by the Traffic Engineering Section. Participation in this research project has enabled the Department to further evaluate the effectiveness of median barrier, curb height, location of guard rail, roadway geometrics, etc.

There is a continual study to determine the benefit v. s. cost of safety improvements. Before and after studies are made to determine the effectiveness of the various safety projects throughout the state. Data and plans are submitted to the Bureau of Public Roads.

Approval has been obtained from the National Highway Safety Board for a highway safety grant to assume costs involved to send

TRAFFIC ENGINEERING SECTION

ten Department Traffic Engineers and technicians to Northwestern University's Traffic Engineering Schools three week-seminars during fiscal 1971.

Following is a list of Highway Safety Spot Improvement Projects that were awarded for construction during the fiscal year:

Type of Improvements	Number of Projects	Cost of Projects
Median and/or Deflective Guardrail	11	\$1,414,549
Signalization of Intersections	9	102,204
Highway Lighting of Intersections	4	2,575
Redesign of Intersections	3	380,255
Redesign and Signalization of Intersections	3	172,539
Ramp Construction	1	133,196
Anti-glare Headlight Barrier	1	3,225
Energy Absorption Barrier	1	8,696
Chain Link Fence	1	24,633
Total	34	\$2,241,872
Federal Aid Projects	13	\$1,743,899
Non-Federal Aid Projects	21	497,973
Total	34	\$2,241,872

TRAFFIC ENGINEERING SECTION

TRAFFIC REGULATIONS UNIT

While the normal functions of the Section in servicing cities and towns continued at a slightly increased level, there was a considerable increase in two other areas, legislation and traffic agreements.

Legislative reports on pending Bills totalled nearly two hundred and appearances before legislative committees numbered over sixty. Also, Bills of particular interest to Traffic were filed authorizing the Department to speed zone all numbered routes, to close State Highway for cause, to exempt State vehicles from certain provisions of law when servicing highways and to increase towing fees.

Traffic control agreements were drafted for Edgartown, Dedham, Gardner and Oak Bluffs. The TOPICS program has expanded considerably and agreements were drafted for Boston, Pittsfield and Wellesley. Meanwhile, the ground work continued to be laid for a number of other agreements.

Nine municipalities completely revised their traffic regulations and six communities which had no prior regulations were assisted in adopting full sets.

Nearly fifty summonses of Department records were answered in court.

SPEED CONTROL

A priority schedule for Speed Control operations was continued in the fiscal year 1969 - 1970.

Comprehensive engineering studies for each highway tested were employed using radar speed meters to measure vehicular speeds, ball bank indicators to test each horizontal curve encountered and

TRAFFIC ENGINEERING SECTION

SPEED CONTROL (CONT'D)

trial runs to evaluate the practicality of the maximum safe speed.

CITY AND TOWN WAYS JULY 1, 1969 - JUNE 30, 1970 PROGRESS REPORT

Pursuant to Chapter 519, Acts of 1967, the following policies and procedures were established to define and identify high accident locations and to establish the administrative process necessary for the implementation of the Act, and also to ensure that the work being done conforms with the National highway safety policies.

Standards were developed as follows:

1. The Department Manual on Uniform Traffic Control Devices shall be used to govern the definition, design, scope and usage of such devices.
2. Identification of high accident and hazardous locations, intersections or sections of streets and highways will be guided by the number of accidents as related to traffic volume exposure. This identification shall be based on accident data obtained over a sufficient period of time to insure statistical reliability. The statistical Method of procedures, including accident reduction and cost effectiveness forecasts for safety improvements, shall be provided by the Traffic Engineering Section.
3. Safety improvements under this act will generally be construed as:
 - a. Channelization of Intersection
 - b. Provisions of additional traffic lanes on approaches to signalized intersections.

TRAFFIC ENGINEERING SECTION

CITY AND TOWN WAYS JULY 1, 1969 - JUNE 30, 1970 PROGRESS REPORT (CONT'D)

- c. Provisions of grade separations.
- d. Addition or improvement of pavement markings, signs, or other devices required in connections with the application of engineering techniques to improve the safety of vehicular or pedestrian traffic.

The following communities have received safety project approval:

Attleboro	North Adams
Boston	Northbridge
Brookline	Quincy
Cambridge	Rehoboth
Chelsea	Scituate
Danvers	Southbridge
East Longmeadow	Springfield
Gardner	Stoughton
Malden	Weymouth
Milton	Whitman

One million dollars have been appropriated for the Chapter 519 program, and \$667,000 have been reserved for projects that have been advertised.

It was necessary for the Traffic Engineering Section to provide guide lines for the establishment of before and after studies and for the calculation of priority listing.

It is anticipated that the balance of monies will be expended before July 1, 1971. Fully documented data can be of significant importance in the event that Federal Reimbursement is obtained at a later date.

TRAFFIC ENGINEERING SECTION

TRAFFIC CONTROL - SIGNAL AND HIGHWAY ILLUMINATION UNIT

The Traffic Control-Signal and Highway Illumination Unit is responsible for that area of Traffic Engineering that covers traffic signal functions and technologies, highway illumination design and technologies, and motorist aid communication systems.

The Traffic Control Signal segment of the Unit is engaged in the following functions:

1. Expediting new state highway projects initiated within the Unit and sent in from the District Offices.
2. Expediting signal updating projects sent in from the District Offices.
3. Issuing permits to cities and towns for traffic signal installations on city and town ways.
4. Review of signal installation designs in the TOPICS Program.
5. Review of signal installation designs in the Chapter 519 and Chapter 90 Programs.
6. Review of Consultant Designs.

CURRENT SIGN POLICY

On February 26, 1969 the Commission approved a new sign policy which was distributed as S. O. P. #HED-70-30-1-000. This S. O. P. superseded C. L. #65-42 dated November 17, 1965, and became effective April 15, 1969. The new policy was formulated on order to clarify some of the points in our then current sign policy and to amend this policy to allow graphic signing to hospitals, airports and telephones on limited access

TRAFFIC ENGINEERING SECTION

CURRENT SIGN POLICY (CONT'D)

state highways.

In regards to Chapter 862, Acts of 1967 (Services Signs) the Department processed and installed signs at the request of four owners of service facilities on limited access highways. Involved was a total of \$6,475.00 in initial fees and a total of \$915.00 in annual fees. These applications were processed under Standard Operating Procedure No. HED-70-05-1-000.

Totals to date: \$13,000.00 & \$1,840.00.

TRAFFIC SIGNS AND PAVEMENT MARKINGS
JULY 1, 1969 - JUNE 30, 1970 ROUTE CHANGES

Route U.S. 1 - Saugus to Brookline

Relocated over former Route C-1 for most part.

Route C-1 - Removed Designation

Route 1-A - Revere-Chelsea-Everett

Removed west of Bell Traffic Rotary

Route 2 - Cambridge-Boston

Relocation and extension to Boston Public Gardens.

Route 2A - Cambridge-Boston

Extension over Massachusetts Avenue to Commonwealth Avenue.

Route 3

Relocated between Southeast Expressway at Garnite Avenue to North side of Boston University Bridge.

Route 3A - Boston

Designation removed from Gallivan Boulevard between Neponset Circle and Adams Street.

Route 9 - Boston

Extended to Copley Square area from Brookline Village via Huntington Avenue

TRAFFIC ENGINEERING SECTION

TRAFFIC SIGNS AND PAVEMENT MARKINGS (CONT'D)

Route 9A - Boston

Removed designation

Route C-9 - Boston

Removed designation

Route 16 - Everett-Chelsea-Revere

Extended easterly from Wellington Traffic Rotary to Bell Traffic Rotary, Revere via Revere Beach Parkway.

Route 20A - Boston-Brighton

Removed designation

Route 28 - Cambridge-Boston

Relocated between McGrath Highway at Commercial Street, Cambridge to Blue Hill Avenue at Morton Street, Boston.

Route C-28 - Boston

Removed designation

Route 32 - Hardwick

Relocated over Lower Road

Route 32A - Hardwick

Extended south to Gilbertville

U.S. Route 44 - Middleboro-Carver

Relocated to new construction between Plympton Street (Route 58), Carver to Plymouth Road, Middleboro.

Route 99 - Saugus to Boston

Established between Saugus Rotary (Route U.S.-1) and City Square, Boston

Route 103 - Somerset

Relocated over Riverside Avenue to Routes U.S. 6 and 138

TRAFFIC ENGINEERING SECTION

TRAFFIC SIGNS AND PAVEMENT MARKINGS (CONT'D)

Route 105 - Middleboro- Halifax

Extended north from Route U.S. 44 Middleboro to Route 106,
Halifax

Route 148 - Sturbridge to No. Brookfield

Established between Route U.S.-20, Sturbridge to Route 67,
No. Brookfield

Route 203 - Boston

Established between Neponset Circle and Centre Street
Circle, Jamaica Plain.

SIGN FABRICATION

The Traffic Engineering Section has processed orders for approximately 17,000 signs for the year. The types and qualities of signs fabricated by the Wellesley Sign Shop are listed in their portion of the report.

STANDARDS - TRAFFIC SIGNS AND SUPPORTS

During the month of May a standard was adopted based on concepts developed in a cooperative research program of the Texas Transportation Institute and the Texas Highway Department for ground mounted sign supports for plywood sign panels with an area over 40 s.f. This standard was reviewed by the U.S. Department of Commerce, Bureau of Public Roads and on April 6, 1970 was approved for use as a standard in Massachusetts Federal-aid construction contracts.

Standards were developed, utilizing aluminum, for structural supports for overhead signs with variable sign areas. These standards were reviewed by the U.S. Department of Commerce, Bureau of Public Roads and on July 22, 1970 were approved for

TRAFFIC ENGINEERING SECTION

STANDARDS - TRAFFIC SIGNS AND SUPPORTS (CONT'D)

use as a standard in Massachusetts Federal-aid construction contracts.

Additional standard drawings were developed, depicting sign face details, for warning and regulatory type signs.

CONTRACT PROJECTS

During the year the approximate cost of traffic signs and pavement markings which were included in contract projects designed by this Unit was \$3,428,406.00.

MILE MARKER PROGRAM

During this fiscal year the Sign Unit embarked upon a program to install mile and tenth-of-mile markers on the numbered route system of the Commonwealth.

This program was initiated in order for the Department to conform with various standards of the 1966 Highway Safety Act.

A compilation of the numbered route system has been completed and this Unit is in the process of preparing a series of contracts for the physical installations.

Upon completion of the installations, the entire State's numbered route system will be tied into a grid to provide a method of location identification which should prove to be of great help to law enforcement personnel, engineers and the general public.

SIGN AND PAVEMENT MARKING INVENTORY

The thirteenth Program Standard of the 1966 Highway Safety Act states that there shall be a minimum criteria of the program to provide a method to ".....identify needs and deficiencies of traffic control devices."

TRAFFIC ENGINEERING SECTION

SIGN AND PAVEMENT MARKING INVENTORY (CONT'D)

On this premise personnel from the Sign Unit of the Traffic Engineering Section, in conjunction with personnel from the Maintenance and Computer Sections, are engaged in development of a program to computerize a sign inventory.

It is proposed to collect data on existing signs on State Highways and code it to provide input data for a computer program.

DIAGRAMMATIC SIGNING

The use of diagrammatic signs has frequently been suggested throughout the country to aid the "foreign" driver find his way through complex interchanges. In order to obtain more factual data regarding the highway efficiency of such signing, this Section undertook a test installation on Route 128, southbound roadway, at the Route 9 interchange.

On March 25 and 26, 1970, Department forces erected three signs, one advance sign and two gore signs. All three signs were fabricated at the Department's Sign Shop in Wellesley based on the minimum design criteria furnished by the Bureau of Public Roads.

Within a matter of days after the signs were installed, the Public Relations Unit of the Department prepared a press release, pertaining to the signs, and encouraged motorists to submit their comments on the signs to the Traffic Engineering Section. The response was gratifying and the pros and cons were pretty evenly split. The most adverse comment was that the signs were "too busy."

On May 7, May 11 and July 21, 1970, interim alterations were made in order to simplify the signs.

TRAFFIC ENGINEERING SECTION

DIAGRAMMATIC SIGNING (CONT'D)

Final conclusions have not been formulated as of the ending date of this annual report.

STATE AID SECTION

The State Aid Section has the responsibility of processing the payment of State Funds to the Cities and Towns in the Commonwealth for the improvement and maintenance of local roads.

CHAPTER 90

Generally, the State pays one-half the cost of construction and improvement projects with the County and the Municipality each contributing one-fourth. Maintenance assignments are usually divided equally with the State, County and Municipality, each contributing an equal share of one-third. The Chapter 90 Tentative Assignments for 1970 total \$16,798,880.00 with the State's share amounting to \$7,990,940.00.

STATE AID SECTIONTENTATIVE 1970 CHAPTER 90 ASSIGNMENTSSUMMARY

COUNTY	STATE	TOWN/CITY	COUNTY	TOTAL
BARNSTABLE	\$ 260,900	\$ 138,950	\$ 138,950	\$ 539,300
BERKSHIRE	494,400	300,175	300,925	1,095,500
BRISTOL	611,800	330,550	330,550	1,272,900
DUKES	44,000	24,750	24,750	93,500
ESSEX	730,500	377,400	361,200	1,469,100
FRANKLIN	366,600	218,200	218,200	803,000
HAMPDEN	629,650	371,400	371,400	1,372,450
HAMPSHIRE	333,550	196,225	196,225	726,000
MIDDLESEX	1,468,300	768,700	776,100	3,013,100
NANTUCKET	28,990	28,990	-----	57,980
NORFOLK	633,100	347,700	347,700	1,328,500
PLYMOUTH	530,200	280,600	283,600	1,094,400
SUFFOLK	618,100	618,100	-----	1,236,200
WORCESTER	1,240,850	728,300	728,300	2,697,450
TOTALS	\$7,990,940	\$4,730,040	\$4,077,900	\$16,798,880

STATE AID SECTION

CHAPTER 81

Section 26 Chapter 81 of the General Laws provides for the expenditure of funds for the repair and improvement of public ways other than State Highways, in the 182 Towns eligible for Chapter 81 participation. The work consists of patching, widening, reshaping, as well as, surface treating with bituminous materials.

The Chapter 81 program for the year 1970 amounts to \$3,561,680.00 with the State's share as \$2,732,675.00.

VALUATION FROM CHAPTER 559-ACTS OF 1945

COUNTY	TOWNS	MILES	-1.40 \$15.00	-2.00 \$25.00	-2.80 \$40.00	-3.50 \$50.00	-5.50 \$75.00	-7.00 \$100.00	-9.00 \$125.00	-12.00 \$150.00
BARNSTABLE	7	395	0	0	0	0	1	5	1	0
BERKSHIRE	23	1008	5	2	4	5	5	1	0	1
BRISTOL	7	457	0	0	0	0	3	2	0	2
DUKES	3	36	0	0	0	0	1	0	2	0
ESSEX	10	409	0	0	1	0	0	2	3	4
FRANKLIN	23	1173	6	1	3	3	4	1	3	2
HAMPDEN	12	667	1	2	3	1	3	1	1	0
HAMPSHIRE	15	769	3	3	2	2	2	1	1	1
MIDDLESEX	24	1533	0	1	1	1	5	3	8	5
NORFOLK	6	300	0	0	0	0	1	1	2	2
PLYMOUTH	8	386	0	0	0	0	3	3	0	2
WORCESTER	44	2804	1	4	1	3	14	8	8	5
TOTALS	182	9937	16	13	15	15	42	28	29	24

TOWNS	ROAD MILEAGE RATIO	MILES	RATE PER MILE	TOWN PAYS	STATE PAYS
16	-1.40	790	15.00	11850.	217250.
13	-2.00	589	25.00	14725.	161975.
15	-2.80	817	40.00	32680.	224675.
15	-3.50	898	50.00	44900.	246950.
42	-5.50	2391	75.00	179325.	657525.
28	-7.00	1621	100.00	162100.	445775.
29	-9.00	1649	125.00	206125.	453475.
24	-12.00	1182	150.00	177300.	325050.
182		9937		\$ 829005.	\$ 2732675.

STATE AID SECTION

BOND ISSUE FOR IMPROVEMENT OF LOCAL ROADS

In accordance with Section 4 of Chapter 768 of the Acts of 1969, which was approved on August 23, 1969, the State Aid Section has the responsibility of processing the distribution of \$5,000,000.00 to the Cities and Towns of the Commonwealth.

Following is a tabulation showing in the aggregate payments authorized to the Cities and Towns in each County.

DISTRIBUTION OF FUNDS

Proposed by Section 4, 1969 Accelerated Highway Act

<u>COUNTY</u>	<u>AMOUNT</u>
Barnstable	\$ 116,040.34
Berkshire	172,689.64
Bristol	326,203.87
Dukes	17,722.96
Essex	501,067.51
Franklin	117,242.39
Hampden	397,190.67
Hampshire	108,361.49
Middlesex	1,028,535.34
Nantucket	13,190.24
Norfolk	473,871.58
Plymouth	238,274.56
Suffolk	914,107.45
Worcester	<u>575,501.96</u>
GRAND TOTAL	\$5,000,000.00

STATE AID SECTION

BOND ISSUE FOR IMPROVEMENT OF LOCAL ROADS

In accordance with Section 5 of Chapter 768 of the Acts of 1969, the Department was authorized to apportion the sum of Fifteen Million Dollars (\$15,000,000.00) among the various cities and towns of the Commonwealth.

The sum credited to each municipality shall be used only to reimburse such municipality for funds expended for the purpose of reconstruction, maintenance and repair of public highways and bridges, and of the enforcement of traffic laws for the calendar year nineteen hundred and seventy (1970).

The Act further provides that the State Tax Commission shall include the amount so estimated (by the mayor of each city and the selectmen of each town in their notification to the Massachusetts Department of Public Works of the amount that will be expended by their respective cities and towns during the calendar year 1970) in the notice to each city and town, as provided in Section 24 of Chapter 58 of the General Laws (Cherry Sheet).

Following is a tabulation showing the aggregate payments authorized to the cities and towns in each county.

DISTRIBUTION OF FUNDS

Proposed by Section 5, 1969 Accelerated Highway Act

<u>COUNTY</u>	<u>AMOUNT</u>
Barnstable	\$ 348,121.02
Berkshire	518,068.92
Bristol	978,611.61

STATE AID SECTION

DISTRIBUTION OF FUNDS (CONT'D)

Dukes	\$ 53,168.88
Essex	1,503,202.53
Franklin	351,727.17
Hampden	1,191,572.01
Hampshire	325,084.47
Middlesex	3,085,606.02
Nantucket	39,570.72
Norfolk	1,421,614.74
Plymouth	714,823.68
Suffolk	2,742,322.35
Worcester	<u>1,726,505.88</u>
GRAND TOTAL	15,000,000.00

RESEARCH & MATERIALS SECTION

The Research and Materials Section is the youngest of the major engineering sections of the Department, being established in 1957. The Section is administered by the Research and Materials Engineer who reports directly to the Chief Engineer.

The Research and Materials Section prepares the Standard Specifications for Materials. Memberships are held on many technical committees including AASHTO, ASTM, A.C.I., HRB, AAPT and others.

The Section is directed into four major units, Soils and Foundation, Research, Laboratory and Materials, and Materials Field Control. In addition the Section provides inspection at many commercial plants supplying materials for state projects.

A brief description of each Unit's activities follows:

SOILS AND FOUNDATION UNIT

The Soils and Foundation Unit was originally formed within the Research and Materials Section in 1957. In Fiscal 1970, the Soils and Foundation Unit expanded its work considerably and assumed a larger responsibility in the following functions:

The Unit reviewed and made recommendations on Boring contracts totaling an approximate value of \$600,000.00. Two State wide Boring contracts were monitored by this Unit representing a value of \$50,000.00. The Department's Boring crew working directly under the Soils and Foundation Unit, completed twenty-seven (27) different projects throughout the State and assisted the Districts in several active construction

RESEARCH & MATERIALS SECTION

SOILS AND FOUNDATION UNIT (CONT'D)

projects providing valuable information required in making design and construction decisions.

The Soils Unit continued its liaison work with the U. S. Geological Survey Branch for Regional Geology in New England. Many sites were examined in conjunction with U.S.G.S. Geologists and recommendations given relative to ledge slope problems and Geologic advice on various matters encountered on projects before and during construction.

Various soil studies were made in conjunction with the evaluation of sub-grade materials in the layered payment design method. Recommendations were give relative to pavement thickness requirements on fourteen (14) projects.

The review of construction procedures, compaction and density results for embankment and sub-base materials on construction projects are a continuing responsibility of the Soils Section. The Nuclear Density Gauge was utilized to a greater degree with satisfactory results. Indications are that Nuclear gauges are reliable and equal to conventional methods in determining densities. Personnel from the Soils Section participated in cooperation with M.I.T. in the development of several research programs. During the winter months, the Soils Unit presented three Seminars in different Districts for all Department personnel relative to techniques in Soils Investigation Procedures. Also, the Unit has been working in cooperation with Bridge Department, Design and Construction personnel in the

RESEARCH & MATERIALS SECTION

SOILS AND FOUNDATION UNIT (CONT'D)

revision of Boring Specifications and the Definitions and Procedures used in Boring contracts.

LABORATORY

The testing units which comprise the Laboratory Section continued their assigned responsibilities of testing and evaluating all materials used by the Department in its 1969-1970 Highway Construction and Maintenance program.

The total amount of testing per sample for this period has substantially increased as compared to last year at this time. The lack of sufficient work and storage space continues to be a hindrance and is an increasing problem with each succeeding year as the amount of testing increases.

In addition to the testing and approval of materials, the Laboratory Section reviews, updates and prepares specifications and manuals for materials used in the construction and maintenance of highways and bridges.

Periodically each testing unit is inspected by national organizations such as the AASHO Materials Reference Laboratory and the Cement Concrete Reference Laboratory, to insure that all equipment and test procedures conform with established standards.

The following is a summary of the activities of each Test Unit which comprises the Laboratory Section:

BITUMINOUS UNIT

This unit is primarily concerned with the quality control

RESEARCH & MATERIALS SECTION

BITUMINOUS UNIT (CONT'D)

testing of all bituminous materials, mixes, pavements and other related materials used in construction and maintenance by the Department. In addition to the routine testing of bituminous materials, this Unit also conducts research, and evaluates new products.

The number of samples tested by this Unit (during the past year) exceeded 2000.

CONCRETE UNIT

The Concrete Unit performs quality control testing on many materials other than concrete. This Unit has under its jurisdiction - cement, concrete, aggregates, metals of all types, fencing, pipes and various cement-concrete related products.

This Unit has cooperated in the Bureau of Standards Cement Reference Program by completely testing four different cement samples and with the AASHO Materials Reference Laboratory by completely testing four aggregate samples. In 1969 we also were inspected by the AASHO Materials Reference Laboratory for proper techniques and equipment. (We are inspected by AMRL in odd numbered years and on even numbered years by the Bureau of Standards, Cement and Concrete Reference Laboratory. The AMRL checks aggregate testing and the CCRL checks cement and concrete testing.)

The Concrete Unit has engaged in various research projects regarding new materials. During the past year this Unit has tested over 7000 samples.

RESEARCH & MATERIALS SECTION

SOILS UNIT

The Soils Unit performs testing on soils and soil-aggregate materials. The purpose of this testing is twofold: 1) to provide quality control of materials used on Department projects and 2) to provide basic data to the Design Engineer.

Materials tested are gravel borrows, ordinary borrows, embankment material, sands, bridge foundation materials, loams, peats, etc.

Plantings used in roadside beautification are inspected for conformance to standards established by the American Standards for Nursery Stock. In addition samples of soils submitted by both the Soil Conservation Service and Water Resources Division of the U.S. Geological Survey are tested and classified. The total number of samples tested during the past year by this unit exceeded 1000.

CHEMICAL UNIT

The Chemical Unit is responsible for the chemical testing all materials used in the work of the Department and physical testing of those materials not covered by the other Units. Examples of materials tested for conformance to specifications are paints, protective coatings, adhesives, glass beads, deicing chemicals, herbicides, pesticides, joint sealers, etc. The number of samples this past year exceeded 1500. The Chemical Unit performed many evaluation studies for the Product Evaluation Committee, and conducted in-house research on paints, protective coatings, etc. The Chemical Unit advises and consults

RESEARCH & MATERIALS SECTION

CHEMICAL UNIT (CONT'D)

with Department Engineers on problems pertaining to coating and feasibility studies on new products.

RESEARCH UNIT

The Research Unit had no staffing until late 1966 when all the functions of research were transferred to the Research and Materials Section and was charged with full responsibility of the administration of all research within the Department. This included preparation of budgets, submission of budgets, submission of budgets to the Department and the Bureau of Public Roads, anticipation of new research, liaison with research contractors and other Sections of the Department.

This past year, the Research Unit was responsible for \$325,000. in active research and \$190,000. in new proposed research using HPR funds. Projects under active research include: Roadside Development, which is looking into better cover for slopes; Hydrologic Studies, which is going to develop new formulas for design of small waterways; and Highway Soils and Foundations, two studies, one which is predicting the movement of soil underneath an embankment and the other is developing a rapid test for determining frost susceptibility of Massachusetts soils. Proposed research includes a means for determining the migration of chlorides through the hydrologic system, pavement studies and skid studies.

RESEARCH & MATERIALS SECTION

RESEARCH UNIT (CONT'D)

The past year the Joint Highway Research Project with M.I.T. produced reports on varved clay and aggregates for asphaltic concrete. This program, annually funded for \$30,000., has been a cooperative program with M.I.T. since 1950 and has produced many outstanding reports.

The product Evaluation Committee which is coordinated by the Research Section was responsible for evaluating many new products introduced, in cooperation with the Laboratory. Among new products approved for Department use is the product DCA-70. This product can be sprayed onto a slope and be used to prevent erosion problems. Another phase of this program is the in-house research, an example of this program is studying new materials for the waterproofing of bridge decks.

Field Experimental Projects on Construction Projects, in cooperation with the BPR, are coordinated with the Districts. One such project this past year was Roadside Development on Rte. 25 in Wareham. Another project is a comparison of Cast-In-Place curbing vs Pre-Cast Curbing vs Granite Curbing in terms of durability and cost.

Four times a year, the Research Section edits and has published by the Department, a Research Activities Report which is distributed nationwide.

RESEARCH & MATERIALS SECTION

FIELD MATERIAL CONTROL UNIT

This Unit conducts a continuous review and approval of all plants supplying either cement concrete or bituminous concrete to the Construction or Maintenance Divisions.

As of 1 January 1970, any project having at least 15,000 ton of bituminous concrete must be supplied by a completely automatic plant with digital printout.

All plants producing material for federal projects are checked intermittently by personnel from this Unit, who take progress-record samples at the plant every 10,000 ton or part thereof for each project. This Sections personnel, check to see that the plant inspector is conversant with all his duties, and that the plant is producing specification material for the project.

During the winter months, the Field Control Section held three-2 day seminars for plant inspectors in cooperation with electronic manufacturers on Automation of Bituminous Concrete Plants. Plant inspectors, plant owners and superintendents attended and heard lectures on the operation of the automatic batching controls, automatic ticket printers, and the necessary testing for documentation of the quality of material. The Specifications and Materials Manual were updated to cover this new automation.

All Job-Mix Formulas are reviewed and evaluated on the bases of Marshall Stability Tests before being approved. Of



RESEARCH & MATERIALS SECTION

FIELD MATERIAL CONTROL UNIT (CONT'D)

sixty-odd plants in the State, twenty one (21) are now fully automated.

At the present time we have eighty-seven (87) cement concrete plants in the State. Personnel from this Unit check each plant, and take progress-record samples of course and fine aggregate on the basis of every 3,000 c.y. of material or part thereof leaving the plant for federal projects. Personnel from this Section also check to see if plant inspectors are conversant with their duties.

Personnel from this Section procure crushed stone samples for quality tests from all quarries within the State and bordering States. This sampling is done semi-annually and applies also to sand and gravel stone from all sand and gravel plants. This unit also random samples all asphalt materials, tars, and emulsions.

A new procedure for obtaining BPR progress samples of reinforcing steel was instituted in 1970.

Field Trips were made at various times with Federal Bureau personnel to cement and bituminous plants for inspections-in-depth. Personnel attended meetings of In-House Committee on distressed pavement investigation and made subsequent field trips for on-site inspection when necessary.

Material Certificates were issued for seventy Federal Aid Projects to comply with Federal regulation for re-imbursement.

RESEARCH & MATERIALS SECTION

MANUFACTURED PRODUCTS

The work consists of supervision and inspection of the fabrication of:

1. Prestressed Concrete Beams for Bridges in accordance with the plans and specifications.
2. Testing and Inspection of Cement Concrete Pipe at point of manufacture.
3. Testing and Inspection of metal pipe, asbestos pipe, clay pipe, etc.
4. Testing and inspection of cement blocks, bricks and other miscellaneous items pertinent to highway construction.

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CONSTRUCTION SECTION

During the 1970 Fiscal Year Construction Projects valued at more than \$102,000,000.00 were awarded, for which the Construction Section of the Department of Public Works is responsible for the inspection. The total length of these projects was approximately 45 miles nearly all of which is multilane or of viaduct construction.

The four largest contracts now under supervision are sections of I-93 and I-695. They consist of the \$23,000,000.00 contract on I-93 awarded last year with three contracts awarded this year, two for \$13,000,000.00 and one for \$19,000,000.00.

Of interest in the Springfield area was the award of a curved girder bridge costing just over \$500,000.00. Construction of this bridge presents unusual engineering conditions because of its particular design. Completion of this project in 1971 will tie in I-91 with the Massachusetts Turnpike (I-90) via I-291.

The two next largest Interstate projects are located on I-95 in Danvers, a \$7,000,000.00 project and on I-86 in Sturbridge, an \$8,000,000.00 project.

Other major construction projects are spread throughout the State with two projects on Route 6 in Yarmouth at \$4,000,000.00 and \$5,000,000.00; a project on Route 52 in Oxford-Webster at \$8,000,000.00; four contracts on Route 140 between Taunton and New Bedford at a total cost of \$11,000,000.00; and a project on Oak Bluffs costing nearly \$2,000,000.00. Demolition in advance of construction accounts for four contracts in Boston, one in Holyoke and one in Fall River.

CONSTRUCTION SECTION

Our safety program continued this year with highway guard installation at a cost of about \$2,000,000.00 and the installation of signs and signals at a cost of about \$1,000,000.00. One unique safety project was the installation of an "Inertial Barrier System" in Lynnfield as a pilot project. The cost was relatively small at \$9,000.00 and may prove to be a solution to accident prevention at several other locations throughout the state. Under the TOPICS program (Traffic Operations Program to Increase Capacity and Safety on urban streets) the first of a series of projects was started in Wellesley with the installation of a coordinated traffic signal system for just under \$100,000.00.

Four Landscaping and Rest Area construction projects accounted for \$500,000.00 worth of work.

A detailed analysis of the projects started during the 1970 Fiscal Year follows:

CONSTRUCTION SECTION

PROJECTS AWARDED DURING FISCAL 1970

	<u>I-86</u>		<u>BID</u>
STURBRIDGE	#14998	2.795 Miles	\$8,098,746.75
	<u>I-93</u>		
BOSTON-SOMERVILLE	#14711	0.644 Miles	12,766,540.70
MEDFORD to METHUEN	#14756	Fencing	470,149.00
MEDFORD-SOMERVILLE	#14979	1.200 Miles	19,146,178.05
	<u>I-93 & Rte. 133</u>		
ANDOVER	#15033	1.403 Miles	507,801.25
	<u>I-95</u>		
ATTLEBORO to SHARON	#14574	Signs	793,122.50
BOSTON	#14548	Demolition	313,790.00
BOSTON	#14980	Safety	43,345.00
BOSTON	#15099	Demolition	244,600.00
BOSTON	#15100	Demolition	93,050.00
DANVERS	#14877	1.917 Miles	7,726,867.01
LYNN-PEABODY-SAUGUS	#14806	Demolition	9,500.00
	<u>I-195</u>		
NEW BEDFORD	#14580	Landscaping	189,863.00
WESTPORT	#14554	Ramp	146,587.90
	<u>I-291</u>		
SPRINGFIELD	#14873	Bridge	510,920.00
	<u>I-391</u>		
HOLYOKE "A"	#14769	Demolition	18,000.00

CONSTRUCTION SECTIONI-495

ANDOVER to METHUEN	#15103	Safety	\$ 210,938.50
BOXBOROUGH to TEWKSBURY	#15086	Safety	272,840.00
HARVARD to WESTBOROUGH	#15080	Safety	117,894.00
SALISBURY	#15231	Safety	3,225.00

I-695

SOMERVILLE	#14628	Bridge	12,467,274.00
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PRIMARY, SECONDARY AND URBANROUTE 1

NEWBURY	#15098	Safety	268,834.50
NORWOOD-WESTWOOD-DEDHAM	#14684	Safety	163,650.00

ROUTE 3

TYNGSBOROUGH	#14878	Landscaping	34,468.60
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ROUTE 6

BARNSTABLE	#14875	Rest Area	78,616.00
DENNIS-YARMOUTH	#14683	5.412 Miles	4,347,740.45

ROUTES 6 & 25

WAREHAM	#15186	4.918 Miles	5,077,720.10
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ROUTES 6 & 28

BOURNE	#14685	Safety	24,632.54
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ROUTES 8 & 20

BECKET	#14856	Safety	46,072.50
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ROUTE 9

FRAMINGHAM-SOUTHBOROUGH			
WESTBOROUGH	#14556	Safety	392,319.00
SHREWSBURY	#14722	Safety	130,174.00

CONSTRUCTION SECTIONROUTE 16

WELLESLEY	#14864	Traffic Control Signals	\$ 94,145.75
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ROUTE 25

WAREHAM	#15087	Landscaping	226,709.00
WAREHAM to RAYNHAM	#14759	Safety	57,031.00

ROUTE 28

FALMOUTH	#14723	Safety	12,940.50
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ROUTE 49

CHARLTON-STURBRIDGE	#14798	3.316 Miles	1,737,294.25
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ROUTE 52

OXFORD-WEBSTER	#14593	3.241 Miles	8,570,169.20
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ROUTE 97

GEORGETOWN-GROVELAND	#14851	0.701 Miles	248,640.30
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ROUTE 128

LEXINGTON	#14863	Signs	73,897.00
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ROUTE 140

LAKEVILLE	#14577	3.631 Miles	2,474,232.02
NEW BEDFORD	#14854	1.934 Miles	3,157,296.85
NEW BEDFORD	#15068	1.070 Miles	3,305,834.00
TAUNTON	#14870	2.801 Miles	2,292,012.62

FALL RIVER EXPRESSWAY

FALL RIVER	#14817	Demolition	109,100.00
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VINEYARD HAVEN ROAD

OAK BLUFFS-EDGARTOWN	#15228	3.250 Miles	818,824.00
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EDGARTOWN ROAD & VINEYARD HAVEN ROAD

OAK BLUFFS-TISBURY	#14557	3.315 Miles	1,036,232.05
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CONSTRUCTION SECTION

MISCELLANEOUS NON FEDERAL AID PROJECTS

ROUTE 1

LYNNFIELD (Safety)	#15101	Inertial Barrier System	\$ 8,696.00
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ROUTES 3 & 62

BEDFORD	#14595	Ramp	133,196.05
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ROUTE 6

DENNIS-HARWICH-ORLEANS	#15083	0.483 Miles	37,367.75
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WAREHAM	#14794	Traffic Signals	14,500.00
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ROUTE 7

LANESBOROUGH	#14633	2.188 Miles	680,539.50
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ROUTE 8

CLARKSBURG	#15082	Bridge	222,020.00
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ROUTE 9

SPENCER	#14869	0.944 Miles	395,513.80
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ROUTE 16

HOLLISTON	#15141	Bridge	103,765.00
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ROUTE 28

BROCKTON	#14866	Safety	10,270.00
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READING-STONEHAM	#14874	Safety	11,776.00
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ROUTES 53 & 123

HANOVER	#15030	Safety	34,950.00
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ROUTE 68

GARDNER	#15012	Fencing	5,218.80
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ROUTE 114

LAWRENCE	#14724	0.200	92,530.20
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ROUTE 128

DANVERS-BEVERLY	#15230	Safety	1,640.00
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CONSTRUCTION SECTION

ROUTE 183

GREAT BARRINGTON	#15128	Bridge	\$ 327,685.00
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MAIN STREET

ACUSHNET	#14807	Drainage Trunk Line	42,081.60
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DODGE STREET

BEVERLY	#15140	0.206 Miles	88,144.00
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DOVER ROAD & BRIDGE STREET

MEDFIELD-MILLIS	#14842	0.213 Miles	377,479.45
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HILL STREET & MONTVALE AVENUE

WOBURN	#15234	Parking Area	18,898.00
(Registry of Motor Vehicles Funds)			
(Engineering assistance provided)			

LONGHILL STREET & MAGAWISKA ROAD

SPRINGFIELD	#15027	Safety	65,347.25
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WAHCONAH STREET

PITTSFIELD	#15013	Roadway & Bridge	204,200.00
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WEST ISLAND CAUSEWAY

FAIRHAVEN	#15071	Bridge	43,397.00
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SLADES FERRY BRIDGE

FALL RIVER-SOMERSET	#14853	Demolition	363,606.00
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DISTRICT NO. 2 ADMINISTRATION BUILDING

NORTHAMPTON	#15131	Heating System	69,450.00
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CONSTRUCTION SECTION

SUMMARY

	<u>MILES</u>	<u>AMOUNT</u>
INTERSTATE	7.959	\$ 64,151,232.66
PRIMARY, SECONDARY & URBAN	33.589	34,778,486.23
NON FEDERAL AID	<u>4.234</u>	<u>3,352,271.40</u>
TOTALS	<u>45.782</u>	<u>102,281,990.29</u>

CONTRACT ENGINEER SECTION

The Contract Engineer's Section processes the bids for Federal Aid Projects requiring B.P.R. Concurrence, State Highway Construction Projects, Chapter 90 Projects, Maintenance Projects, Waterways Projects, Boring Projects, projects for the construction, reconstruction, alteration, remodeling, repair, or demolition of buildings under the provisions of General Laws, Chapter 149, and Right of Way Projects involving the sale of houses, and the leasing of State-owned property, from bid opening to award of contract and maintains all the necessary records therefor. The prequalification and post-qualification of contractors is administered by this Section and the issuance of Proposal Forms and plans to prospective bidders requires the approval of this Section. Force account agreements with public utilities, cities and towns are reviewed for approval.

MAJOR ACTIVITIES

1. At bid openings all proposals are publicly opened and read subject to verification for arithmetical correctness, examination for informalities and compliance with applicable statutes.

2. After a bid opening all proposals are immediately checked for compliance with requirements. Proposals that are unacceptable due to incompleteness, irregularities, collusion,

CONTRACT ENGINEER SECTION

MAJOR ACTIVITIES (CONT'D)

qualifying clauses, etc., are duly noted and if the deviation is a matter of substance that is prejudicial to the rights of other bidders a recommendation for rejection of such bid is made on the other hand, a deviation may be merely a matter of form or some immaterial variation from the exact requirements that can be waived by the Commission under the right reserved. In the latter instance, if such bid is the lowest bid submitted, a recommendation will be made that the informality be waived and the project awarded to this low bidder as being in the best interest of the Department. After all bids have been checked and verified a "Summary of Bids" is prepared, printed and collated for distribution to interested Sections, Divisions, District of the Department, contractors who bid on the particular project, and local trade magazines and publications. Copies are retained for the Sections records.

3. Letters recommending award or rejection are prepared and typed by this Section for the Chief Engineer's signature for presentation to the Board. Such letters are routed to our Fiscal Section for an assignment of funds. For work involving Federal Funds, letters are also prepared and typed for the Chief Engineer's signature, requesting Bureau of Public Roads concurrence in the award or rejection of contracts as required by Federal Regulations.

CONTRACT ENGINEER SECTION

MAJOR ACTIVITIES (CONT'D)

4. Prequalification Statements submitted by contractors as required by General Laws, Chapter 29, Section 8B are analyzed, computed, and a Rating determined for submission to our Prequalification Committee.

Performance Records of Contractors who have previously performed work for this Department are maintained in this Section, and are designed to provide facts and documented data on every completed project and the contractor's performance thereon. Such records provide a source of information for recommendations made by the Contract Engineer to the Prequalification Committee for the determination of Prequalification Ratings or limitations thereon as warranted by the facts.

5. For projects for which prequalification is not required, the low bidder and/or the lowest responsible bidder must submit a post-qualification statement, duly signed and sworn to, outlining his experience, equipment and financial resources on forms supplied by this Department. These post-qualifications statements are computed and analyzed exclusively by this Section and on the basis of the computation and analysis a recommendation for award or rejection is made to the Board.

CONTRACT ENGINEER SECTION

MAJOR ACTIVITIES (CONT'D)

6. Since the enactment of the Prequalification Statues all requests for Proposals and Plans for bidding purposes have to be cleared and approved by this Section. This policy was adopted so as to prevent the issuance of Proposals and Plans to contractors who are ineligible to bid because of failure to meet the requirements of the Prequalification Stature and Regulations.

7. Records of all activities of this Section are maintained for purposes of documentation and a source of information.

(a) A complete alphahbetical file of all contractors who have performed work for this Department is kept current at all times. This file shows the location of each project which the contractor has performed, the advertising date, bid opening date, bid amount, date of award, and starting and completion dates.

(b) A card index file for each project awarded, showing date of advertising, opening of bids, date of award, office estimate, bid price, contractor's name and address, contractor's qualification, start of construction, date of completion, extensions of time, if any, and contractor's performance record.

(c) A card file of projects awarded in each city or town, showing name of contractor, type of project, and the starting and completion date of all contracts performed within the city or town.

CONTRACT ENGINEER SECTION

MAJOR ACTIVITIES (CONT'D)

(d) Prequalified contractors, their prequalification rating and date of expiration.

(e) A list of "Active Bidding Contractors" who submit bids for any project for this Department each calendar year is prepared and maintained.

CONTRACT ENGINEER SECTION

MAJOR ACTIVITIES (CONT'D)

PROJECTS AWARDED FOR FISCAL YEAR ENDING JUNE 30, 1970

<u>NUMBER</u>	<u>CATEGORY</u>	<u>AMOUNT</u>
47	FEDERAL AID	\$106,226,595.14
25	STATE HIGHWAY CONSTRUCTION	3,411,330.95
42	CHAPTER 90	6,419,287.65
321	MAINTENANCE	7,196,197.93
26	WATERWAYS	2,599,261.49

461	TOTAL	\$125,852,673.16
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During the fiscal year July 1, 1969 to June 30, 1970 a total of 268 Contractors were prequalified.

FINAL REVIEW SECTION

The work of the FINAL REVIEW SECTION consists of checking each of the quantities for the various items which represent the amount of work done by a contractor in constructing sections of Highway Bridge and other work done under contract with the Department of Public Works. This checking consists of reviewing all supporting data for each of the various items as recorded in manifold books, pile books, calculation books, time books and other records of the Resident Engineer; the plotting and sub-grading of final roadway, rock and peat cross-sections so that an accurate final pay quantity may be determined; and the computation of borrow pit quantities based on preliminary and final surveys of the borrow areas. After determining each of the final quantities of the various projects, a cost sheet is prepared so that the construction engineer and others may know the cost comparison with bid and allotment amounts, and a careful analysis is made between the Resident Engineer's quantities and the Final's quantities as well as between the Preliminary and Final quantities so that explanations of all differences which exceed 10% may be determined and prepared. Greater use is being made of the computer for deriving accurate pay quantities for Roadway, Rock, Peat and Loam Stripping items. A recent innovation, the "Quality Control Ledger", that documents and expedites projects work has proven its worth to the satisfaction of all concerned.

FINAL REVIEW SECTION

"Pre-Final" review teams have been formed which consist of 2 or 3 men from the Final Review Section who are requested to visit various projects nearing completion and finalize items directly at the construction site. This operation reduces controversies and expedites the processing of the project because the availability of the Resident Engineer affords the opportunity to solve any differences of opinion immediately and effectively. This procedure has been accepted favorably by the Districts. The following is a "Breakdown" of the value of contracts processed by the Final Review Section during the period from JULY - 1969 through JUNE - 1970

FINAL REVIEW SECTION

BREAKDOWN VALUE OF CONTRACTS PROCESSED BY THE FINAL
REVIEW SECTION

VALUE OF STATE HIGHWAY CONSTRUCTION CONTRACTS:

HAVING FEDERAL AID PARTICIPATION . = \$ 89,368,896.74

VALUE OF STATE HIGHWAY CONSTRUCTION CONTRACTS:

NON-FEDERAL AID . = 3,136,053.27

VALUE OF STATE AID (Chapter 90) CONTRACTS: = 4,545,428.96

VALUE OF MAINTENANCE CONTRACTS: = 8,073,843.99

VALUE OF MISCELLANEOUS CONTRACTS: = 6,317,593.80

(Includes Consultant Services, Boring
Contracts, Boston - (P.W.B. Contracts),
Traffic, etc.

Total . . \$ 111,441,816.76

NOTE:

Not included in the above totals are one
hundred and ninety-nine (199) Federal
Estimates (FINAL FEDERAL AID VOUCHERS)
which were submitted during the period
of July-1969 thru June 1970.

PROCEDURES & RECORDS SECTION

I. PROJECT REVIEWS

Review Teams from this Section have continued their review of all active construction projects located Statewide to insure compliance with Department Standard Operating Procedures, Contract Specifications and other controls governed by Department policy. In addition, these reviews insure the maintaining of established high standards of construction and acceptable documentation thereof for all items incorporated into the respective projects and, thereby, assuring prompts reimbursement of funds from the Federal Government. A product of overseeing the continued application of a uniform system of record-keeping procedures is the development of trained engineering field personnel available for assignment in any of the Department's eight (8) districts with little or no loss of efficiency.

Over the past year, teams have conducted approximately 130 reviews. As per Department policy, reports of these reviews are submitted directly to the Chief Engineer with copies distributed to the Construction Division, Research & Materials Division, respective District and the Bureau of Public Roads. As stated in the past, by reporting directly to the Chief Engineer, the required independence and implementation of recommendations are assured. When apparent necessary policy revisions are noted, they are prominently cited in the report. Those minor deficiencies found in the course of inspections are generally resolved either at the Project or District levels.

PROCEDURES & RECORDS SECTION

II. EQUAL EMPLOYMENT OPPORTUNITY

One of the prime functions of this Section is the administration of the EEO Provisions of the Federal Highway Act of 1968. Although the program has only been in effect for approximately 18 months, its successful implementation is evident in the results of statistical information gathered from all active Federal Aid projects in September 1969. This information is required in the form of an Annual Report for the Federal Highway Administration, Bureau of Public Roads, and reflects the total employment force (with respective classifications) of each Contractor and Subcontractor performing work on Federal Aid projects in the Commonwealth as of July 31, 1969. This constituted a total of 53 projects for a total of \$218,000,000 in construction contracts.

A total work force of 2,913 employees was reported with 345 or 11.9% classified as minorities. Of these, 3.8% were Negro and 7.5 were Spanish surnames. Based on the 1960 Census, 2.4% of the population was non-white with the Negro accounting for 2.3%.

It is apparent from the foregoing, that the Affirmative Action Program, although still in early stages of development, is off to a successful beginning and is representative of the splendid cooperation received from all those involved in this undertaking.

PROCEDURES & RECORDS SECTION

EQUAL EMPLOYMENT OPPORTUNITY (CONT'D)

A. EEO COMPLIANCE REVIEWS

Working in close cooperation with Division and Regional representatives, personnel from this Section have conducted numerous project and home-office site reviews to assure contractor compliance with EEO. This constant vigil has resulted in a harmonious relationship with all concerned in working together to assure success in this most sensitive area.

B. TRAINING PROGRAMS

One of the basic requirements of Affirmative Action is the establishment of training programs specifically involved with the highway industry and program.

Upon receipt of copies of U.S. Senate Resolution 169, Expert from the Congressional Record (3-24-69) which placed particular emphasis on the joint responsibility of BPR and respective State Highway Departments in undertaking training programs to assure the availability of qualified minority group applicants in all categories of employment, representatives from this Section and the BPR held several conferences with officials from NERBA to assure compliance with this facet of the program. Resultant was the development of the Laborers Training Center located in Hopkinton and administered by the Mass. Laborers Training Trust Fund.

PROCEDURES & RECORDS SECTION

EQUAL EMPLOYMENT OPPORTUNITY (CONT'D)

It was decided to utilize this as a pilot program for submission to the FHWA for their approval before submitting subsequent programs for other organization. On Monday, March 9, 1970, the Center began its first class which consisted of 32 trainees representing 29 different cities and towns throughout the State. These trainees receive a salary of \$98 plus \$5.00 for each dependent and also are reimbursed 5¢ per mile for travel to the Center during their four week training period (considerations is being given to expand this to 6-8 weeks). Following graduation, the trainees are placed with a Contractor on a project site and receive journeyman's wages. Follow-up visits are made by personnel from the Center with each trainee after placement to judge individual progress.

This program has received the approval of both the Division and Regional Offices of the BPR and, just recently, approval was received from the Secretary of Transportation, John A. Volpe. Remaining programs being held pending receipt of approval of the Mass. Laborers Training Program and based on this format, will be inaugurated for other organizations to provide qualified applicants in remaining trade categories of the industry.

PROCEDURES & RECORDS SECTION

III. SUMMER YOUTH OPPORTUNITY

This Section was assigned the task of working in liaison with the BPR in soliciting the road construction industry in providing gainful employment to disadvantaged youths through the Summer Youth Opportunity Program which has been endorsed by the American Road Builders Association and Associated General Contractors of America, Inc.

In this regard, the Department was requested by the BPR to provide certain statistical information gathered from those companies participating in the program for the months of June and August.

Correspondence was prepared and forwarded to every Contractor and Consulting firm performing work for the Department advising them of the Program, its benefits and soliciting their assistance in compiling the required statistics for completing a final report.

At this writing, no conclusive figures are available to determine the success of this most worthy venture.

IV. LIAISON WITH OTHER AGENCIES

A. Bureau of Public Roads

In addition to those duties with regard to In-Depth Reviews of construction projects and EEO Compliance, this Section continues to function as the Department's Liaison with the BPR.

Continued progress has been made in the area of resolving citations delaying processing of Final Vouchers resulting in Final Reimbursement of funds from the Federal Government.

PROCEDURES & RECORDS SECTION

LIAISON WITH OTHER AGENCIES (CONT'D)

B. Other Agencies

NERBA - A productive rapport has been established with this organization (representing contractors throughout both the State and New England) which has been conducive to the successful implementation of the overall EEO Program. The excellent relationship developed here can only lead to continued cooperation, in other areas of mutual interest and involvement.

AHONAS - Under the direction of the Chief Engineer and the Commissioner who was then Vice President and is the current President for AHONAS, this Section continues to maintain liaison with this vital organization. Assistance was rendered in the preparation of Program and attendant details for the 1970 Convention held in New York City which Commissioner Ribbs was Chairman of the Program Committee. Presently, this Section is lending assistance to the Commissioner's Office in anticipation of the forthcoming 47th Annual Meeting & Convention to be held in Philadelphia, Pennsylvania.

MISCELLANEOUS - In fulfilling obligation both as liaison with outside agencies and as EEO Coordinator, personnel from this Section participated in the FHWA Civil Rights Conference held at Delmar, New York and the 4th Annual Joint State-BPR Construction Engineers Conference in New Jersey. On both occasions, the EEO Coordinator delivered an address on this

PROCEDURES & RECORDS SECTION

LIAISON WITH OTHER AGENCIES (CONT'D)

Department's progress and procedures in EEO.

STANDARD OPERATING PROCEDURES - Working in cooperation with the Methods, Systems & Procedures Section, this Section has continued the review of Standard Operating Procedures prior to implementation to insure procedural correctness. This Section has made recommendations for revisions intended to clarify and minimize procedures requirements for Sections reporting to the Chief Engineer primarily as applicable to the District Offices.

RECLAIMS - FINAL VOUCHER DEDUCTIONS BY THE BUREAU OF PUBLIC ROADS - This Section reviewed deductions applied by the BPR. Substantiation and justification was assembled, compiled, and presented for the submission of reclaims in the amount of \$448,479.56.

D

MAINTENANCE SECTION

CONFERENCES AND MEETINGS

During Fiscal 1970 ten conferences were held under the chairmanship of James F. Kelley, Maintenance Engineer.

Four conferences were on General Maintenance, namely, Personnel, Management, Communications, Maps and Statistics, with other subjects submitted by each District for open discussion.

One each conference was held on Structures, Highways, Equipment, Roadsides and Traffic. A Snow and Ice Control School was conducted in each District.

All District Highway Engineers, District Maintenance Engineers, Assistant Maintenance Engineers, and their respective Unit Assistants were present and/or represented at these conferences.

The purpose of said conferences was to discuss various Maintenance policies, review problems, and reaffirm uniformity of operations.

Also this year representatives of the Bureau of Public Roads were invited, and they discussed various aspects of Maintenance and noted that they would appreciate being invited to future conferences.

The Maintenance Section was responsible for the physical maintenance and certain traffic services of 2,713 lineal miles of State Highway and 1,977 bridges.

The present total of 2,713 lineal miles represents a total of 9,460 lane miles as compared to 9,176 lane miles in Fiscal Year 1969.

MAPS AND STATISTICS UNIT

This unit maintains statistical data on all State Highways, such as length, width, thickness of pavement shoulders and foundations, year built and whether built under construction, reconstruction or resurfacing projects.

MAINTENANCE SECTION

MAPS AND STATISTICS UNIT (CONT'D)

Maintenance expenditures, cost comparison and analyses are prepared by this unit as required by the Department.

The Maintenance costs are reported by District and Activities. A cost per lane mile of each item is also shown. Bridge and Highway coding numbers are set up by this unit. All highway data has been set up in the electric computer and breakdown of the data can be obtained as required for Department use.

All Districts are supplied with a tabulation of the State Highway by Repair Sections and broken down into Highway Routes, Towns, Types, width, lane and lineal miles, etc.

The Snow and Ice Control Schedule and maps are prepared in this office.

ROADSIDE MAINTENANCE

Activities carried on under the Maintenance Section Roadside Development Unit during Fiscal 1970 consisted on Contract Tree Planting, Mist Blower Spraying, Hydraulic Soil Sterilant and Custom Spraying, Mowing of Grass, Removal of Trees and Stumps and Travel Trash Collection, Normal Force Account Roadside Maintenance activities, such as Brush Control for Safe Sight Distance, Vista Clearing, Selective Clearing and Trimming, Rest Area and Truck Turnout Improvement and Maintenance, Drainage Ditch Clearance, Emergency Tree Removal and Trimming along with Litter Pickup, were carried on in all Districts.

MAINTENANCE SECTION

REGULATORY PERMIT - July 1, 1969 - July 1, 1970

During the year the following permits were issued by the Boston Office:

	<u>No. of Permits</u>
Heavy Equipment, House Trailers and Buildings	20,229
Utilities	512
Driveways	<u>149</u>
Total	20,890

During fiscal year 1970, 7,750 permits have been issued via telegram.

SNOW AND ICE CONTROL

Snow removal on State Highways is carried out under authority of Section 19, Chapter 81, of the General Laws as amended.

During the 1970 Fiscal Year the Department plowed and treated with spread chemicals 9,250 lane miles of State Highway.

Snow removal on Town roads is carried out under the authority of Section 11, Chapter 83, of the General Laws. During the year, the Department cooperated on plowing 470 linear miles of Town highways. Under the Act, the highways selected were plowed in cooperation with the Town with 50% of the cost being borne by local agencies.

Snow and Ice Control activities include: responsibility for proper performance of plowing snow, spreading sand and chemicals, erection of snow fences, the clearing of waterways, winter patrolling of the highways, removal of snow from bridges, loading and hauling of snow from certain structures and the clearing of signs and signals. The Snow and Ice Control Section is also

MAINTENANCE SECTION

SNOW AND ICE CONTROL (CONT'D)

responsible for the post season contracts to clean highways and catch basins, the acquisition and improvement of Maintenance Areas and the system of fog warning on highways.

The program for providing industrially pre-mixed sodium and calcium chlorides has continued to improve. In Fiscal Year 1970, The Chemical Corporation supplied 35,864 tons based on a contract for 36,000 tons in the ratio of 5 parts sodium to 1 part calcium (by weight). By virtue of an allowable provision, the same contract was extended to satisfy our 1971 Fiscal Year needs. The cost of \$21.30 per ton has been expanded by \$0.625 (to \$21.925), a required absorption of freight rate increases granted by the I. C.C. The material blending and its use have been decidedly enhanced through added experience..

Department forces have completed or have in the final stages of construction, ten (10) storage sheds for winter chemicals. Materials and standard design for said sheds were provided to the Districts. Each is simple pole type, all wood except for aluminum roofing with an independently supported inner buttress wall 8' in height. Building dimensions are 40' wide, 18' clearance to the roof tresses and lengths changeable by 12' increments. Eight are 60' long, material cost \$5,600.00 and estimated to hold ± 650 tons. Another is 84' long, material cost \$7,200.00 and estimated to hold ± 900 tons. The last is 96' long, material cost \$9,000.00 and estimated to hold ± 1100 tons of two types of material.

It is presently the Department's intent to institute a program of construction by contract of these sheds. Design simplicity at minimum cost to provide maximum functional value appears to have been worked out and a reasonable standard achieved. Such provision is not only to offer maximum

MAINTENANCE SECTION

SNOW AND ICE CONTROL (CONT'D)

protection against ground water pollution at our stockpiles but save as well in prevention of material loss to preceipitation, in elimination of polyethylene covers (\$25,000 annually) and in affording greater Summer intake at lesser purchase price (net \$50,000 annually). An amount of \$300,000.00 has been appropriated to begin this program which will exceed \$4,000,000.00 on completion.

The concept of two-year contracts was instituted this past year for catch basin cleaning. Ten such contracts were awarded as a pilot, the advantage being elimination of 1 year's complete contract processing-- preparation, advertising, award -- since each of the aforementioned was to do the same work, in the same areas, during the same season in each of the two succeeding Fiscal years. This not only servies the Department's best interest but becomes more attractive to contractors in affording them a year's scheduling in advance and warrant for further investment in their equipment. The concept worked well with a minimum of problems and has since been extended to 35 highway cleaning contracts.

The problem of dense fog's sudden development on high speed highways leading to multiple accidents has been programmed for operational solution. The Department's meteorological consultant, Weather Services, Inc., of Bedford, has had written into their contract provision for such forecasting in addition to their usual forecasting services and agreement has been reached with the State Police for observation pursuant to warnings of potential fog development. Department forces are then alerted for placement of warning devices as conditions deteriorate. It is an initial approach toward a serious but somewhat indefinite set of weather phenomena which will depend mainly on improving forecasting techniques.

MAINTENANCE SECTION

SNOW AND ICE CONTROL (CONT'D)

The Storm Emergency Center's Communication with the several State agencies and surrounding cities and towns during the past winter was comparatively quiet. During the prior two (2) winters, this media, established to facilitate access to and exodus from the core city, was used effectively on many occasions. Last winter can best be characterized as very severe, an almost continuous sequence of smaller storms (28 average State-wide), with a high frequency of freezing and thawing cycles, plaguing the highway crews and motorists. None were sufficient to incur extensive tie-ups but were of the size and low-temperature variety that cause extensive chemical outlay and must be classified as expensive.

EQUIPMENT

The following Equipment was purchased in the 1970 Fiscal Year:

- 100 - Pickup Trucks
- 24 - Four Wheel Drive Snow Units
- 162 - Snow Plows
- 2 - S & R Trucks with Cranes
- 4 - Tower Trucks
- 10 - Electricians Utility Trucks
- 4 - Sweepers
- 3 - Hydraulic Utility Trucks
- 14 - Front End Loaders
- 35 - Stake & Rack Trucks
- 20 - Pavement Markers

MAINTENANCE SECTION

EQUIPMENT (CONT'D)

- 9 - Rollers
- 12 - Sander Bodies
- 13 - Dump Trucks
- 12 - Pickups - 6 Man Cab
- 1 - Fork Lift Truck
- 2 - Ladder Trucks
- 1 - New Radio Base Station - complete - Worcester to Wachusett Link
- 24 - Two-way Mobile Radios

The Equipment Unit Setup Charts showing the Equipment to be replaced through 1975.

The Maintenance Planning Unit is in the process of up-dating the Maintenance Manual with an expected publishing date of early September 1970. Future Maintenance Planning calls for preparation of the following:

1. Long Range Program for each Maintenance Unit, up to and including the year 1975.
2. S. O. Ps. to govern each phase of each Maintenance Unit.
3. Written job analysis of each position for each Unit of the Maintenance Section.

HIGHWAY MAINTENANCE

For the purpose of maintaining the surfaces of our State Highway System, including drainage facilities, shoulders and guard rails, each of the eight Districts of the State is divided, geographically, into working sections containing as nearly as possible, ninety (90) lane miles of surface. Due consideration is given to other pertinent factors, such as isolated sections of State Highway, physical barriers etc., and necessary temporary adjustments made during the procedure of establishing the working sections.

MAINTENANCE SECTION

HIGHWAY MAINTENANCE (CONT'D)

Each maintenance section is staffed in accordance with a previously approved staffing formula within the limits of positions and personnel made available to the Department by others.

Maintenance consists of routine or physical maintenance work and betterment work. Physical maintenance consists of maintaining the highway and its existing facilities or restoring it to its originally constructed condition and includes surface treatments with liquid bitumens and cover aggregate, or as has been the case almost entirely for the last ten years, treatment by the application of bituminous concrete overlays of less than 3/4" in depth.

Betterments include improvements and additions to the originally constructed highway, such as drainage and guard rails and includes overlays of 3/4" depth and over, which represent capital outlays.

Physical maintenance and betterment projects are carried out both by using Department forces and by contract. As our lane mileage increases each year, because of our lack of sufficient personnel and in the interest of economy and allowable time, most of the major items of maintenance, either physical or betterments, are being performed under advertised contracts.

The substance of this report will deal primarily with a summary of major items of physical maintenance carried out by contract and with betterment work carried out by contract, including resurfacing.

PHYSICAL MAINTENANCE

Routine maintenance operations were carried out by Department Maintenance Forces, and included such operations as minor shoulder repairs, and certain shoulder or surface treatment with liquid bitumen and sand or stone cover. A regular program is prepared annually to carry out surface treatments throughout

MAINTENANCE SECTION

PHYSICAL MAINTENANCE (CONT'D)

the eight (8) Districts of the State by the application of Class I Bituminous Concrete Type S.T.

This year twelve contracts were awarded for surface treatment covering a total of approximately fifty-four (54) lineal miles.

The Department has no maintenance depot or personnel located on the Island of Nantucket; therefore, maintenance of the only State Highway (Siasconset Road) on the Island has been carried out by the Town of Nantucket under contract with the Department. The sum of \$10,000.00 was allotted for this work.

BETTERMENTS - FORCE ACCOUNT

Twelve (12) Force Account Betterments, located in Districts 2, 4, 5 and 8 were approved to be carried out by District Maintenance Forces during the year at a total estimated cost of \$25,875.00. Work performed included new drainage installations, new guard rails, sidewalk preparation and installation of traffic safety islands.

Two (2) Betterment Projects, located in Districts 7 and 8 were carried out by contract during the year at a total cost of \$47,000.00. Project work involved new drainage installations. Funds for this work were made available from the Accelerated Highway Program.

RESURFACING

Although only \$2,000,000.00 was appropriated and allotted to the resurfacing account for Fiscal 1970, an additional \$500,000.00 was made from the Accelerated Highway Program.

MAINTENANCE SECTION

RESURFACING (CONT'D)

Accordingly a total of nineteen (19) contracts were awarded during the year for the resurfacing of approximately fifty (50) miles of highways with Class I Bituminous Concrete Type I-1, varying in widths of from 24 feet to over 60 feet and varying in depth from 1-1/4" to 2-1/2".

MISCELLANEOUS

Preparation of the report on "Quotation Prices per ton for Bituminous Concrete Patching Mix Furnished and Loaded at Plant" was completed following the "Critical Path Method Chart" used for the past couple of years and with additional assistance by the computer section.

The long range resurfacing program was completed giving enough information to program approximately \$3,000,000.00 per year for the next five years.

Maintenance appropriations are substantially inadequate to properly carry out needed maintenance and betterment operations if we are to keep pace with the constantly increasing mileage of our State Highway System owing largely to the construction of the Interstate System.

Delay in obtaining funds for surface treatments at the time they are initially proposed frequently results in deterioration of the surface where resurfacing becomes necessary at a much greater expense. Likewise, assignment of funds near the end of a fiscal year, as has been done in previous years, does not allow sufficient time for the preparation of contracts and completion of the work before the end of the fiscal year, at which time use of non-continuing accounts expire.

MAINTENANCE SECTION

MISCELLANEOUS (CONT'D)

Therefore it is recommended that:

1. Resurfacing funds be made a continuing account so that contracts may be programmed to start at the beginning of the construction season (April or May) and continue throughout the summer.
2. That appropriations for proper maintenance of our Highway System be made commensurate with the normal requirements for same.
3. That such steps as necessary be taken from time to time to encourage the Legislature to make provisions for the preceding recommendations.

E

DIVISION OF WATERWAYS

FUNCTIONS AND DUTIES

The functions and duties of the Division of Waterways consist of the preparation of plans, and the undertaking of Shore protection, harbor development, stream clearance and flood control projects; it has charge of great ponds, public rights in certain streams, Commonwealth tidelands, rights in lands, flats, shores and tidewaters and must ascertain, as far as practicable, the location, extent and description of such lands; investigate the title of the Commonwealth thereto; ascertain what parts thereof have been granted by the Commonwealth; the conditions, if any, on which such grants were made, and whether such conditions have been complied with; what portions have been encroached or trespassed on and the rights and remedies of the Commonwealth relative thereto; prevent further encroachments and trespasses; ascertain what portions of said land may be leased, sold or improved with benefit to the Commonwealth and without injury to navigation or to the rights of riparian owners.

Upon application, it issues licenses for structures in certain rivers, tidewaters and great ponds and permits for dredging and other activities on the land and waters under its jurisdiction, providing such are in the best interest of the Commonwealth. It furnishes hydraulic data to the Highway Division for use in drainage and bridge design and maintains and operates certain State lands and State piers.

Authority for the above may be found in the provisions of Chapter 91 of the General Laws.

DIVISION OF WATERWAYS

In the course of performing the previous mentioned functions and duties during fiscal 1970, hearings were held by the Department, acting under the provisions of Section II of Chapter 91, on petitions for the improvement, development, maintenance and protection of tidal and non-tidal rivers and streams, harbors, tidewaters, foreshores and shores along public beaches. Hearings were also held on petitions for licenses for structures in, over or under tidewaters, great ponds and certain streams and for permits for excavation or dredging in same; and, subsequently, 15 permits and 172 licenses were granted, 29 contracts were completed and 32 contracts were awarded.

In addition, numerous inspections have been made and reports submitted on (1) the progress of construction under licenses and estimates for billing under the same, (2) unlicensed encroachments, (3) research relative to existing licenses and licensed structures, (4) assignments of great ponds to be surveyed and (5) petitions for establishment of rights-of-way thereto. The granting and issuance of leases (deeds in certain instances) and permits for use and occupancy of State-owned land and other properties under the jurisdiction of the Division, including the islands in the great ponds, has also been a function of the Division, as well as replying to the continual and extensive inquiries from the public relative to their rights and responsibilities in the tidal waters and great ponds.

The Division has processed over 650 applications and related

DIVISION OF WATERWAYS

notices for requests to fill on marshlands (Chapter 130, Section 27A and Chapter 31, Section 117C).

The Division of Waterways, acting as the design and contracting agent for the Public Access Board, has completed the following work during fiscal 1970:

Projects Under Design	2
Projects Under Construction	7
Projects Completed	3

The Division of Waterways has 4 projects scheduled for design and 4 projects ready for construction in fiscal year 1971. Up to 8 additional projects may be scheduled for design and construction upon approval of a supplemental appropriation of funds for the Public Access Board. Since 1963, when the Public Access Board was established, the Division of Waterways has completed 53 boat launching ramps and facilities.

The Division of Waterways also acts as the design and contracting agent for recreational facilities (skating rinks and swimming pools) as authorized under Chapter 632 of the Acts of 1966 and Chapter 906 of the Acts of 1969, and in fiscal 1970 has completed the following work:

Projects Completed:

2 Skating Rinks	(Greenfield & North Adams)
5 Swimming Pools	(Worcester, Westfield, Ludlow, Milford & Fitchburg)

Projects Under Design:

3 Skating Rink Additions & Alterations	(Brockton, Springfield & Worcester)
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DIVISION OF WATERWAYS

During fiscal 1970, the Division supervised the transportation of solid waste across Massachusetts Bay and the offshore burning of approximately a quarter of a million tons of combustible building demolition material.

DIVISION OF WATERWAYS

EXPENDITURES

FISCAL 1970

Ordinary Maintenance & Administration Division	\$ 786,200.32
State Pier at Plymouth	8,163.79
State Pier at New Bedford	<u>19,720.61</u>
	\$ 814,084.72
 Dredging & Construction	 <u>\$5,710,527.72</u>
TOTAL WATERWAYS EXPENDITURES.....	\$6,524,612.44
 Construction Work Performed for Public Access Board in Fiscal 1970	 \$ 192,893.45
 Construction Work Performed on Recreational Facilities (Skating Rinks & Swimming Pools) in Fiscal 1970	 \$2,226,906.75

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BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

The Bureau of Transportation Planning and Development, Massachusetts Department of Public Works, was established in accordance with legislation adopted by the Acts of 1964, Chapter 563. The executive and administrative head of the Bureau is the Director of Transportation Planning and Development.

This Bureau serves as the principal source of transportation planning in the Commonwealth and conducts research, surveys, demonstration projects, and studies in cooperation with the Federal government, other governmental agencies, and appropriate private organizations and is responsible for the continual preparation of comprehensive and coordinated transportation plans and programs. In addition it maintains a data bank of all available transportation information statistics for reference use by all public agencies in the Commonwealth.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

TRAFFIC ANALYSIS AND FORECASTING

During Fiscal 1970, the Systems Traffic Estimating Unit developed design traffic data for seventy-three (73) proposed highway improvement projects. The scope of the projects ranged from a simple intersection to relocation of primary highways. Included in these analyses was the proposed Interstate 895 in the corridor from Attleboro to Warren, Rhode Island. Projects were developed from requests as follows:

- Highway Design - 55
- Bridge - 1
- Locations - 12
- Districts - 5

Major projects developed in Fiscal 1970 were as follows:

- Route 2 Fitchburg - Westminster
- Route 25 Mansfield - Bourne
- Relocation Route 7 Pittsfield - Lanesboro
- Relocation Route 20 - Brimfield
- Salem - Beverly Connector
- Relocation Route 23 Great Barrington - Monterey
- Relocation Route 9 Ware - West Brookfield
- Route 52 Sterling - Ashburnham
- Relocation Route 85 Marlborough - Bolton
- Route 128 Connector - Gloucester - Rockport

In addition, traffic forecasts were developed for 1975 and 1990 on the 13 interstate highways as the traffic phase of The 1970 Estimate Of The Cost Of Completing The National System Of Interstate and Defense Highways In The Commonwealth Of Massachusetts. As part of this project agreements were reached with the adjoining states relative to volume estimates at state lines.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

ECONOMIC IMPACT STUDY - ROUTE 128

Preliminary meetings were held during fiscal 1970 with the Massachusetts Department of Commerce and Development to develop a work program and a cooperative agreement for the conduct of the study. Higher priority planning needs of the Department cause postponement of further progress until a future date when financial resources and personnel would be available.

THE EASTERN MASSACHUSETTS TRANSPORTATION STUDY AREA

Inner Belt Study - Task A

The technical work on the Task A Study was completed during Fiscal Year 1970. Future traffic assignments were made to the Department of Public Works' recommended alignment and the City of Cambridge's alternative alignments is included in Volume I of the Report. Volume II contains the Task A Committee members' discussion of the Study. The Report will be published early in Fiscal 1971.

Boston Metropolitan Area Study

The Continuing transportation planning effort for the Boston Area was begun. A Technical Advisory Committee was organized to assist and advise the Department of Public Works on the conduct of the continuing process.

Data collection accounted for the bulk of the effort during Fiscal 1970. Many data sources were investigated in order to obtain the best available socio-economic figures for comparison with the Study forecasts. Nevertheless, the figures compiled are still basically estimates. The use of these current estimates as criteria for making decisions concerning the needs for revised socio-economic forecasts is not warranted until the

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

estimating procedures have been validated. The 1970 Census data should provide the necessary information to accomplish this.

Summaries of the data collected will be contained in the Annual Report for the Boston Metropolitan Area Transportation Study. This Report will be published in Fiscal 1972. A majority of the background material has already been collected.

During the year there was considerable discussion among the Bureau staff and with consultants concerning future traffic assignments for the Boston Area. The highest priority work item was established and the Bureau is awaiting a proposal from the consultant for the portion of the work load which lack of staff prohibits the Bureau from accomplishing itself. The proposal would result in the development and validation of a 24-hour capacity restrained assignment technique and 1990 traffic assignments using that technique. The new refined assignments are expected to be more realistic than either the 24-hour unrestrained assignments from EMRPP or the 3-hour capacity restrained assignments from Task A.

Central Merrimack Valley Area Study

This area is one of four segments comprising the former Eastern Massachusetts Regional Planning Project Area, however it is still tied to the total area for traffic assignment procedures. It was planned to separate this area from the EMRPP assignment procedure, but it was not possible due to the lack of sufficient funds and available personnel to accomplish the task of recoding the data.

An effort was made to help reorganize the local T.C.C.,

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

Central Merrimack Valley Area Study (Cont'd)

which was accomplished. Although many meetings have been called in this area, there has been only a few meetings in which a quorum has been present to accomplish any official committee business.

Department personnel have attended the Central Merrimack Valley Regional Planning Commission monthly meetings regularly, thereby establishing liaison with the participating communities.

Various highway presentations have been made in the area to keep the citizens informed, but attendance has been poor.

A copy of the National Highway Functional Classification and Needs Manual was given to the Regional Planning Agency along with our determination of the 1990 estimated urban-in-fact limits for their review and comment.

Lowell Area Study

This area is also one of four segments that once comprised the former Eastern Massachusetts Regional Planning Projects, however, it is still tied to the total area for traffic assignment procedures. Like the other four areas it was hoped that the past year might have seen the removal of this area from the EMRPP assignment procedure but it was not possible due to the lack of sufficient funds and available personnel to accomplish the task.

An effort was made during the year to reorganize the Transportation Coordinating Committee but to no avail. A new approach was recommended involving the establishment of the T.C.C. as a committee of the Northern Middlesex Area Commission. This arrangement is still in the process of effectuation.

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Lowell Area Study (Cont'd)

Department personnel have attended the Area Commission monthly meetings regularly, thereby, establishing good liaison with its members.

A presentation of the National Highway Functional Classification and Needs Study was made to the staff of the Area Commission. The Commission reviewed the 1990 Urban-in-fact limits and revisions were made based on the Area Commission's recommendations.

During the year good communications and working relationships were developed with the Northern Middlesex Area Commission.

Old Colony (Brockton) Area Study

This area is another segment of the former Eastern Massachusetts Regional Planning Project Study Area, however, it is still tied to the total area for traffic assignment procedures. Like the Central Merrimack Valley and Lowell study areas it was not possible to remove this area this year from the EMRPP assignment procedure due to the higher priority demands on our resources.

An effort was made during the year to reorganize the Transportation Coordinating Committee but to no avail.

Department personnel have attended the Area Planning Commission monthly meetings quite regularly, thereby, establishing good liaison with the regional agency.

A presentation of the National Highway Functional Classification and Needs Study was made to the staff of the Area Commission and their assistance sought in reviewing the 1990 Urban-in-fact limits.

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Old Colony (Brockton) Area Study (Cont'd)

Improved communications and working relationships were achieved this year with the Old Colony Planning Council.

SOUTHEASTERN MASSACHUSETTS AREA TRANSPORTATION STUDY

This study area consists of 30 communities, and is one of the largest study areas in the State.

The Transportation Coordinating Committee in this area is relatively active, having at least quarterly meetings during the year.

A presentation of the Statewide Highway Transportation Plan was made at a joint meeting of the Transportation Coordinating Committee and Regional Planning Commission plus a presentation of the National Highway Functional Classification and Needs Study was made to the Regional Planning staff. The estimated 1990 Urban-in-fact limits were presented for their review and comments which resulted in revising the limits.

A fine cooperative working relationship has been developed with the Regional Planning Commission by the Bureau of Transportation Planning and Development's participation in a land use update of two of their communities.

Another aspect of the continuing planning phase was the collection of available socio-economic data and preparation of an Annual Report on the growth of the study area as it concerns the consistency with the original forecast.

The Southeastern Massachusetts Study Area has effective 3C planning process (comprehensive, continuing, cooperative).

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

SPRINGFIELD AREA TRANSPORTATION STUDY

The Consultant for the Springfield Urbanized Area Comprehensive Transportation Study made a presentation of the Final Report to the public officials of the area.

The Transportation Coordinating Committee for the area has remained inactive since the presentation and most of the liaison work with the communities has been with the Planning Director of the Lower Pioneer Valley Regional Planning Commission.

Department personnel have attended the Lower Pioneer Valley Regional Planning Commission meetings regularly, thereby establishing good liaison with the members representing the communities.

A presentation of the National Highway Functional Classification and Needs Study was made to the Regional Planning Commission and their aid enlisted to review the estimated 1990 Urban-in-fact limits. Revisions were made to the limits based upon the Planning Commission's recommendations.

Further implementation of the three C process is being negotiated with the Regional Planning Agency for assistance in preparing the Annual Report on the socio-economic growth of the area.

WORCESTER AREA TRANSPORTATION STUDY

This study area comprises the City of Worcester and eleven (11) surrounding towns. The Worcester Urbanized Transportation Study report was completed and a presentation to the public officials of the area and the Transportation Coordinating Committee was made in February 1970. With the exception of a few constructive criticisms, the report was well received by the public.

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WORCESTER AREA TRANSPORTATION STUDY (CONT'D)

The Transportation Coordinating Committee has been inactive due to a lack of apparent interest in spite of the efforts of the Central Massachusetts Regional Planning Commission and the Department to make it effective.

Bureau of Transportation Planning and Development representatives have met with the Central Merrimack Regional Planning Commission staff numerous times during the year, covering such subjects as the estimated 1990 Urban-in-fact limits and analysis of area transportation problems and goals.

An Annual Review Report of the study area was initiated late in Fiscal 1970 and is expected to be completed in early Fiscal 1971.

The Bureau cooperated with the City of Worcester in supplying pertinent travel data collected in the transportation study to be used in an economic study of the City.

FITCHBURG-LEOMINSTER AREA TRANSPORTATION STUDY

The study area encompasses two (2) cities and two (2) towns for a total of four (4) communities. The Initial Study was completed in 1967 and the study area is in the continuing phase of urban transportation planning.

An Annual Review Report of the Study was initiated Early in 1970 and is expected to be completed and printed by the end of 1970.

The Transportation Coordinating Committee has been fairly active in pursuing regional transportation goals by meeting with Department of Public Works officials and also aiding in the preparation of the Annual Review Report. Bureau of Transportation

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

FITCHBURG-LEOMINSTER AREA TRANSPORTATION STUDY

Planning and Development representatives have met with the Transportation Coordinating Committee and also the Montachusett Regional Planning Commission during the year on transportation matters.

The Montachusett Regional Planning Commission was presented with our version of the 1990 Urban-in-fact limits for review and comment. The Montachusett Regional Planning Commission with the appointment of a Director has begun to function effectively and has been very cooperative in working with the Bureau of Transportation Planning and Development aim of developing a workable comprehensive, continuing, cooperative planning process for the area.

PITTSFIELD AREA TRANSPORTATION STUDY

The study area Annual Review Report showed that the growth of the area closely followed the forecast made by the Pittsfield Urbanized Area Comprehensive Transportation Report.

A presentation of the Statewide Highway Transportation Plan and an open discussion was held at a Transportation Coordinating Committee meeting attended by many interested citizens and public officials.

A representative from the Department attended the Berkshire County Regional Planning Commission meeting regularly, thereby establishing good liaison with its community membership.

A presentation of the National Highway Functional Classification and Needs Study along with the Department's version of the estimated 1990 Urban-in-fact limits were made to the Transportation Coordinating Committee and Regional Planning Commission.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

PITTSFIELD AREA TRANSPORTATION STUDY (CONT'D)

An update of dwelling units was attempted on a trial basis, but was terminated after two months as it required greater resources than available in the Bureau.

The Transportation Coordinating Committee in this area continued to be one of the most active. It assisted the Bureau in the collection of data for the Annual Growth Review Report.

COMPREHENSIVE TRANSPORTATION PLANNING FOR SMALLER URBAN AREAS

A work program has been developed and negotiations are being conducted with a consulting firm, for comprehensive statewide transportation planning for small urban areas.

A detail work program and procedures have been prepared for an Origin and Destination study in the Williamstown-North Adams area to be performed jointly with the staff of District #1 starting in July 1970.

This Origin and Destination survey is to update travel data last taken in 1962, supply need data for TOPICS and for small urban area transportation study.

FRINGE PARKING FACILITY PLANNING

It was anticipated that fringe parking facilities would be included in the Urban Corridor Demonstration Program which the U. S. Department of Transportation was sponsoring to relieve congestion in difficult traffic corridors throughout the country. However, the application by the Metropolitan Area Planning Council for the Southeast Corridor in the Boston Area was not one of the few selected by the U. S. Government. Consequently no action was taken under this item during the fiscal year.

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UNITED STATES 1970 CENSUS

Basic to transportation studies is detailed socio-economic information concerning the population, employment, auto ownership, income, etc. For the heavily populated areas the 1970 Census was designed to make use of an Address Coding Guide.

In the preparation of the Address Coding Guide the federal agencies called upon state and local agencies for assistance. As one of the major users the Bureau of Transportation Planning and Development participated in the project during the summer of 1969.

In the late spring and summer of 1970 work was started on expanding the Address Coding Guide to a Geographic Base File. This is also known as the Dual Independent Map Encoding (DIME) system. As with the previous project Bureau personnel participated in the project.

The U. S. Bureau of the Census and the U. S. Bureau of Public Roads have developed a standard method of tabulating and presenting information pertinent to urban area transportation studies. This requires a table of equivalents between traffic zone units and census units of blocks, block group, enumeration districts and census tracts. A substantial start was made on the preparation of tables for the several urban area transportation studies.

SPECIAL STUDIES SECTION

This section is responsible for analyzing and evaluating New Transportation Needs 1970-1990. The scope of investigation covers airports, commuter rail transit, Northeast Corridor High Speed Ground Transportation, goods movement, and several projects of miscellaneous character requiring immediate needs in the Department.

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SPECIAL STUDIES SECTION (CONT'D)

During the past year the section produced the following reports:

- (1) "Inventory of Service Facilities and Highway Access for Massachusetts Airports", publication #5095. This inventory was made to emphasize the interdependence of the different modes of transportation. The appraisal of highway conditions provides a beginning for identifying qualitative access needs for our airport system.
- (2) "Public Works Building Employees Parking and Travel Study". This Study of the Department of Public Works and the Registry of Motor Vehicles employees parking and travel characteristics was done in order to provide management with data to assist them in evaluating near and long term solutions in Department parking resources and location problems.
- (3) "Interagency Committee Report on the Boston Metropolitan Airport System 1970-1990". The Bureau of Transportation Planning and Development participated as a member of the Interagency Technical Committee assigned the task of evaluating the need of a second air carrier airport and the needs of general aviation in the Boston hub airport region. The report was forwarded to the Governor, the General Court and member agencies in June.
- (4) "Trucking Directory For-Hire Trucking in Massachusetts Publication Number 5055 - An Inventory of the Trucking Companies in the For-Hire Trucking Industry has been compiled. The listings are by city and town as well as by special category. The information has been bound in a volume including maps showing the companies throughout the state by category and further listings of the cities and towns within each district. The primary purpose is for the use of the men in the districts in accomplishing the interviewing of a percentage of truckers in their districts in the Goods Movement Study.

The following is a status report of active projects:

- (1) Goods Movement - An all modes commodity transport inventory. With continued emphasis solely on the for-hire trucking industry, a directory of the latter was compiled. By enlisting the services of our district offices to personally interview a percentage of the truckers listed within their district by means of answering the questions in a brief questionnaire, we

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anticipate extracting the data necessary to formulate an image of the effect of this category of truck operations on commodity movement. Approximately 45% of the questionnaires have been completed. Districts 1, 4, 5, 6 & 7 are complete. District 8 is just beginning the interviews. District 3 is interviewing and the Boston Office will begin the interviewing in District 2 as they do not have the personnel to do the job. Analyses of completed interviews have been initiated. Data displays are under design.

- (2) Logan Airport Travel Study - The study is in the working stage. The field work of interviewing the ground travel to and from Logan International Airport is completed. A Consultant has been hired to accomplish the analyses required by the project tasks. The Department is acting as Project Director for the Interagency group consisting of the Massachusetts Bay Transportation Authority, Massachusetts Port Authority, Massachusetts Turnpike Authority and the City of Boston. The study is authorized and being partially funded by a Technical Studies Grant from the Urban Mass. Transportation Administration, Department of Transportation. Field results indicate that approximately 60,000 daily vehicle trips are made in and out of Logan; of approximately 107,000 daily person trips, 2,900 are made on the shuttle bus.
- (3) Massachusetts Statewide Airport System Study - The Department through the Bureau of Transportation Planning and Development has entered into negotiations with the Massachusetts Aeronautics Commission to jointly perform a statewide airport system study. The Bureau of Transportation Planning and Development prepared an application for funds to finance the study. The Department of Transportation through the Federal Aviation Administration will provide funds authorized under the Federal Aviation Act of 1970. The Massachusetts application was the first submitted and will be used as a prototype for future application. The study will be a comprehensive transportation study administered by the Department of Public Works. The Bureau of Transportation Planning and Development has prepared an outline of the Work Program and a Staff Guide. The proposal is under consideration by the Federal Aviation Administration (Department of Transportation) in the Washington Office.

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TRAFFIC STUDIES

Traffic Volume Counting Program

Approximately 4,000 volume counts were taken during Fiscal 1970 from permanent traffic counting stations, control counting stations, coverage counting stations and special volume counts.

Turning movement studies and vehicle classification studies, required for project design, were conducted at various locations throughout the State.

Recorder tapes were reveiwd and edited for the permanent and control stations , and new programs are being developed for the Department's new IBM 360 Model 40 computer.

In 1969, the Traffic Volume Counting Program was completely revised to reflect the volume data requirements of the Highway Classification Phase of the Statewide Highway Transportation Study. This revision requires the taking of volume counts on all classes of roads and not just on numbered routes as in the past. This is being accomplished by counting on one-fifth of all classified road segments each year. Starting in 1969 and continuing each year, all major segments will have been counted by 1973. In addition annual counts are continuing on the Interstate system and for the outer cordons of the Urban Areas. By comparison with the permanent and control stations which are being counted throughout the year, every year, an influence factor is obtained and Annual Average Daily Traffic Volumes can be determined for all stations.

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Traffic Volume Counting Program (Cont'd)

A program is in effect for the installation of automatic counting equipment by the Maintenance Force of the Department, and the inclusion of the installation of permanent loop detectors in future advertised Construction and Maintenance Projects.

Work was started on the 1969 Traffic Volumes Report covering approximately 4,000 counting locations on various service types of highway facilities.

Vehicle Weight and Characteristics Study

The "1968 Truck Weight Study Report" was prepared and issued. The Annual Vehicle Weight and Characteristics Study for 1969 was conducted for the Bureau of Public Roads during the July-August period at fourteen locations throughout the State. The purpose of the study was to establish truck characteristics relative to magnitude, composition, axle weights, gross weights and commodities carried. Under a new policy the Truck Weight Study Report is not to be issued, but the field data was transmitted to the Bureau of Public Roads for inclusion in the Highway Statistics Report to be issued by them at a later date.

STATEWIDE SYSTEMS AND PROGRAMMING

1968 National Highway Functional Classification Study

The National Highway Functional Classification Study, as required by Section 17 of the 1968 Federal-Aid Highway Act, officially started in Massachusetts on April 10, 1969 with the receipt of the final study manual to be used by the States.

Since Massachusetts had recently completed a Statewide Functional Classification Study as part of an overall Statewide

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

1968 National Highway Functional Classification Study (Cont'd)

Highway Transportation Study, a careful examination of the relationships between the criteria and results of the Statewide Study and what was required by the National Study was made.

This examination showed that although there were differences, the overall concepts of functional classification, statistical area definitions and functional system characteristics regarding the Studies appeared to be in concordance.

For these reasons, the National Study was conducted by making maximum use of the previously completed Statewide Study results. It must not be implied that the Statewide Study results were directly and totally applicable to the National Study. As mentioned previously there were differences as follows:

1. The population data used in the Statewide Study was based on 1960 Census information. It was therefore necessary to estimate the 1968 population for all urban and rural areas in the State.
2. Urban area boundaries, although developed in the Statewide Study in 1966, had to be re-examined and updated.
3. The ranking and grouping of population centers required considerable adjustment from the Statewide Study procedure.
4. A complete reclassification was required in areas where there were uncompleted portions of the Interstate System. The Statewide Study classified all roads assuming the entire Interstate System was "in place".
5. The Manual requires the mileage of all facilities reported on PR-528, "Summary of Existing State and Local Roads and Streets" as of December 31, 1968. The Study was conducted using mileages developed in our 1965 Road and Street Inventory. It is our intent that all future mileage reports will also use the mileages obtained from our Inventory Program.

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1968 National Highway Functional Classification Study (Cont'd)

6. The functional systems developed in our Statewide Study had to be adapted by combining classes to meet the requirements of the National Study.
7. Additional work items not included in the previous study had to be undertaken. Mileages, population and land areas within the "urban-in-fact" boundaries had to be determined and travel estimates for each functional system cross-indexed by Federal-Aid Systems had to be estimated.
8. The National Study had to be completed in one-sixth the time period needed to complete the Statewide Study.
9. Although an extensive and comprehensive review procedure over a six month period was undertaken in the State Study, a reexamination of the classification plan by local officials was required in the National Study.

HIGHWAY STATISTICS

Rural and Urban Highway Mileage Analysis

The Annual Mileage Reports for the year ending December 31, 1969 were completed and forwarded to the Bureau of Public Roads.

Highway mileages, both local and State, are reported on a series of forms which are interrelated as to total mileage analysis. Each report, however, reflects a separate and individual mileage analysis.

Collectively, they represent mileages by rural, urban and municipal classifications on Federal Aid Systems, and also mileages by surface types, widths, average daily traffic and access control.

Publications printed and distributed:

1. Local Road Mileage - December 31, 1969
2. Highway Mileage Statistics - 1969

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HIGHWAY VEHICLES USING FUEL OTHER THAN GASOLINE

The Annual Report on vehicles using diesel oil for fuel was completed and forwarded to the Bureau of Public Roads.

Both the number of owners and the number of each type of vehicle were indicated in this report.

LOCAL HIGHWAY FINANCE ANALYSIS

Work in 1970 included collecting and analyzing the receipts and disbursements for all highway purposes by the local government units in Massachusetts. The statistical report prepared from the data usually contained in Schedule A of the annual city and town financial reports are submitted to the Bureau of Accounts, Department of Corporation and Taxation.

The collection of the data represents a tremendous amount of effort in verifying and analyzing the accounts to fulfill the detailed categories of expenditures and receipts required by the Bureau of Public Roads "535" Report. In addition, data from each of the 351 cities and towns was assembled by groups according to population; for Standard Metropolitan Areas and for counties.

This report also covers information relating to the Maurice J. Tobin (Toll) Bridge and the Callahan and Sumner Tunnels of the Massachusetts Port Authority, the turnpikes of the Massachusetts Turnpike Authority and the public parking facilities of the Massachusetts Parking Authority.

MAPPING

Mapping - Rural and General

A copy of the Federal Aid System was made on a set of the General Highway Maps or "County Series Maps". This copy was made from the set held by the Federal Aid Program Section.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

Mapping - Rural and General (Cont'd)

which set had been previously checked by Bureau of Public Roads personnel. After careful checking, we were then ready to order the acetate reproducibles.

A set of reproducibles was made on acetate from the General Highway Maps "Culture Negatives". Marking tape was affixed to the reverse side to indicate the Federal Aid System. Legend: stars for primary routes, dots for secondary routes and elongated ellipses for interstate routes. This set has been checked against the Federal Aid Program Section set; has also been checked by the Bureau of Public Roads personnel and copies have been distributed on a limited basis to offices where we are confident that an early appraisal will result in detection of minor errors which will in turn enable us to make the necessary changes before making more general distribution.

Currently we are delineating urban area boundaries on our reproducibles with strips of Zip-a-Tone shading which is also being applied to the reverse side of the acetate reproducibles.

As has been the policy, since copies of the General Highway Maps were produced on a quantity basis in fiscal 1968, map sheets have been distributed, via the Library and the Mapping Section, to interested parties withing the outside the Department.

We are attempting, on and when time is available basis, to produce a route log of sorts starting with the records in the Urban and Rural Highway Mileage Analysis Section.

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

Federal Aid System Revision

Several submissions have been made to the Bureau of Public Roads requesting minor revisions in the Federal Aid Primary and Secondary Systems plus one urban area revision request. Plans have been made to check Federal Aid Systems for consistency across state lines.

Federal Aid Primary Type II Systems

Two (2) maps have been submitted to the Bureau of Public Roads requesting approval of Type II Systems for the "TOPICS" program.

STATEWIDE HIGHWAY TRANSPORTATION SECTION

NATIONAL HIGHWAY FUNCTIONAL CLASSIFICATION AND NEEDS STUDY

(1970 to 1990)

The current major activity of the Statewide Section is processing material for the National Highway Classification and Needs Study 1970 to 1990. The guidelines for this study are contained in Manual B of the National Transportation Planning Study being conducted by the fifty states in cooperation with the U. S. Department of Transportation, Federal Highway Administration, Bureau of Public Roads.

Completion dates for this study are as follows:

- a) Preliminary Classification data on September 1, 1970.
- b) Manual "B" except Section IX on April 1, 1971.
- c) Section IX of Manual B on July 1, 1971.

The classification phase of the study will encompass all existing mileage plus that needed to satisfy 1990 demands. Needs evaluation will involve use of sampling and the functionally classified system mileages will be the universe for the expansion

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STATEWIDE HIGHWAY TRANSPORTATION SECTION

NATIONAL HIGHWAY FUNCTIONAL CLASSIFICATION AND NEEDS STUDY

(1970 to 1990) (Cont'd)

of the sampled data.

The functionally classified systems developed during this study, the minimum tolerable conditions and design standards used, and the costs estimated are for study purposes only and in no way represent a commitment or policy change by the U. S. Department of Transportation, the Commonwealth, or the local participating units of government.

In order to comply with the requirements of the study, the Department appointed a coordinator. Each Bureau, Division and/or Section within the Department has been developing study data for their respective disciplines in compliance with the Manual B guidelines.

The Statewide Section is developing 1990 functional systems. Work is being done on developing Needs Routes and Study Sections on the Principal System. Traffic counts are being taken and plotted. Future traffic is being forecast and traffic factors are being developed. Our Road Inventory is being updated and information for the National Study is being utilized.

The progress of the study is on schedule and it is expected to meet the completion dates established by the U. S. Department of Transportation.

G



BUREAU OF SOLID WASTE DISPOSAL

Chapter 834 established a Bureau of Solid Waste Disposal within the Department of Public Works and the intent of the legislation is to dispose of "solid waste" with "solid waste disposal facilities" from any source in any manner and at any site which is concurred in by the Department of Natural Resources and the Department of Public Health.

Section 20 states that "The Commissioner shall establish, pursuant to the provisions of section three, a bureau of solid waste disposal. It shall be the responsibility of the bureau to carry out the provisions of sections twenty through twenty-four, inclusive."

Section 21 also states, "The department with the cooperation of the Department of Public Health and the Department of Natural Resources, shall investigate and study the solid waste disposal needs of the commonwealth and after a public hearing, shall develop and submit to the appropriate regional planning agencies for their review and comment, proposed programs for solid waste disposal including plans for their implementation. The department with the aforesaid cooperation, may designate regional solid waste districts, to carry out the purposes of sections eighteen through twenty-four, inclusive."

BUREAU OF SOLID WASTE DISPOSAL

Section 22. The department shall annually submit for approval, by certified mail, to each city and town a proposed budget indicating the projected costs of the disposal of solid wastes originating within such cities and towns.

The Department of Public Health, on a continuing basis, shall review and make recommendations to the department on the manner of operation and adequacy from a public health standpoint of any solid waste disposal facility planned, established, or operated under the provisions of sections twenty through twenty-four, inclusive, and the department shall implement such recommendations, subject to appropriation.

Section 23. Money received by the department relative to solid waste disposal, including but not limited to funds received from assessments on cities and towns shall be credited on the books of the commonwealth to a fund to be known as the Solid Waste Disposal Fund.

Section 24. The Department shall maintain records of the costs of carrying out the provisions of sections twenty through twenty-one.

Interpreting the intent of the legislation as extracted from Chapter 834 above it appears that the Bureau of Solid Waste Disposal is to be the operating agency to investigate, study and propose programs along with plans for implementation. The Department of Public Health would be the agency which would approve plans for conformance to the existing public health code and the Department of Natural Resources would be involved in site determination as it applies to their restrictions on land use.

BUREAU OF SOLID WASTE DISPOSAL

Therefore, the initial step in solving the problem of solid waste disposal is to undertake a comprehensive, coordinated and complete study of existing facilities for disposal.

Using population studies, present and predicted trends in solid waste generation, and collection, a needs program can be developed.

The needs study should be directed to regional approach to the problem and solid waste disposal districts should be outlined which will consider the most economical collection system or systems, and the decision on the type of facility should be determined by the area involved, the amount of refuse and the relative economics of facilities.

A solid waste collection, treatment, and disposal plan should be developed for the Commonwealth up to the year 1995. This study should cover all sources and considerations that have a bearing on the most feasible and economical collection, treatment, storage and disposal sites. Maximum use should be made of available information from Federal, State and local sources concerning present and projected population and densities; present and future industries; utilities; solid wastes collection, treatment and disposal facilities; present and anticipated land, air and water usages; present and future highway, transportation and circulation patterns; present and projected sources of solid wastes; property assessment and road records; soils studies; geology; hydrology; comprehensive air pollution;

BUREAU OF SOLID WASTE DISPOSAL

sewerage, water resources, public water supply and other related comprehensive studies; and local and regional land use and development plans.

The Bureau of Solid Waste Disposal was created by Chapter 834 Acts of 1969 on August 25, 1969.

A meeting was held on September 3, 1969 with the Department of Public Health and Department of Natural Resources. Representatives from each department discussed the implications of the new law. Topics that were discussed included the responsibilities of each agency, what personnel would be needed to implement the provisions of the law, the use of consulting engineers and proposed actions.

A second meeting was held on October 1, 1969 with the Departments of Public Health and Natural Resources. The main topic was centered on what facilities were available on a state-wide basis. A basic questionnaire prepared by Public Works was presented for discussion. After modifications by Public Health, the questionnaire was acceptable to the three agencies and it was agreed to send it to all cities and towns with a letter of transmittal. The letter was drafted and approved by the three agencies and it was agreed to forward the letter and questionnaire as soon as possible.

BUREAU OF SOLID WASTE DISPOSAL

Between October 3-6, 1969 letters of transmittal and questionnaires were mailed to 351 cities and towns.

On October 7, 1969 the Department contacted the Federal Department of Health, Education and Welfare requesting all available information from their Bureau of Solid Waste Management. Mr. Earl J. Anderson of said Bureau forwarded an up-to-date library of information.

At a department meeting on October 10, 1969 the question of funds to implement the new law was discussed. It was agreed that a deficiency budget would be needed to acquire funds necessary for the program of solid waste disposal operation. Funds would be needed for a basic staffing and to hire qualified consultants. The ten million appropriated in the law could only be used for capital expenditures.

On October 23, 1969 at a meeting of District Highway Engineers the subject of Solid Waste Disposal was discussed. The use of certain regional planning reports was considered as a source of information.

As of November 6, 1969, 179 questionnaires had been returned to the department. Copies were forwarded to Public Health.

A department meeting was held on November 7, 1969. It was decided to institute a state-wide land-use map to be used to study sites for sanitary landfills, incinerators or other solid waste disposal facilities.

The 1971 budget request was completed. A budget to include 26 positions and money for consultants totaled \$1,851,232.

BUREAU OF SOLID WASTE DISPOSAL

The special budget or deficiency to cover from February 2 to June 30, 1970 totaled \$189,000 -- was approved and submitted.

On November 8, 1969 a state-wide map showing the results of the inventory from the questionnaire was started.

A memo to Commissioner Ribbs suggesting a meeting of interested parties to discuss the operations of Bureau of Solid Waste Disposal. Commissioner Ribbs set up a meeting for November 25, 1969.

The meeting was held with Commissioner Ribbs, Associate Commissioner King, Chief Engineer Horgan, Deputy Chief Whitcomb, Assistant to Commissioner Donovan, Engineer McKenna and Acting Director Gallagher. It was decided to complete the report on Saugus Dump for December 19, 1969 Hearing. It was also decided to work a small staff on a reimbursable account. The staff would process questionnaires, answer inquiries, present talks or lectures to interested parties, interview prospective consultants, etc.

On November 26, 1969 Chapter 834, Acts of 1969 creating the Bureau of Solid Waste Disposal became effective.

BUREAU OF SOLID WASTE DISPOSAL

Between November 27 - December 18, 1969 a lengthy study was prepared of conditions at Saugus Dump. Could not recommend alternate solutions to solve problem. No staffing and lack of consulting engineering services made new law ineffective.

John F. Gallagher was appointed as a member of Advisory Board at the Technical Guidance Center for Industrial Environmental Control at University of Massachusetts to sponsor national seminar on industrial waste sometime in April.

The Solid Waste Disposal Inventory was reviewed by the Data Processing Section. Coding sheets and punched card formats will be designed.

Questionnaires can be used to find interchangeable data for determining amounts and locations of refuse.

John F. Gallagher attended a meeting at University of Massachusetts Technical Guidance Center for Industrial Environmental Control. Discussed proposed program for national seminar on industrial waste to be held in April in Boston.

From December 20 - 31, 1969 the Bureau continued with inventory of cities and towns. Studied previous reports by MAPC, New England Regional Commission and Federal Bureau of Solid Waste Management.

January 5 - 9, 1970, interviewed prospective consultants, continued inventory, reviewed further reports on refuse collection and disposal. Started study on possible Federal grants for pilot studies on Solid Waste Disposal in Massachusetts.

BUREAU OF SOLID WASTE DISPOSAL

January 23, 1970, presented a talk to officials of Towns of Westwood, Needham, Dover, Sharon, Wrentham, Medfield, Norwood, Walpole and Dedham. Discussed provisions of Chapter 834 and presented possible solutions to solid waste disposal.

As of January 30, 1970 236 questionnaires have been returned from 351 cities and towns.

During the month of January reports were prepared on eleven bills which were filed pertaining to Solid Waste Disposal.

On February 10, 1970, Gallagher presented a talk to officials of Franklin, Wrentham, Plainville, Milford and Bellingham at Dean College along with a representative of Public Health.

Howard Whitmore and John Gallagher met with Commissioner Casazza and Associate Commissioner Flaherty of the City of Boston to discuss present and long range plans for waste disposal.

On April 28 - 29 1970, J. F. Gallagher presented a talk on the Department's role in solid waste disposal at a seminar in Dedham.

H. Whitmore and John Gallagher attended a conference on Industrial Waste Management at Framingham Motor Inn sponsored by COMTECH of the University of Massachusetts, May 12 - 13, 1970.

BUREAU OF SOLID WASTE DISPOSAL

On May 15, 1970 John F. Gallagher gave the keynote speech at the annual Massachusetts Society of Professional Engineers meeting in Newton.

John Gallagher participated on a panel before representatives of towns of Southboro, Berlin, Hopkinton, Westboro, Shrewsbury, Grafton, Upton, Boylston, and Northboro and city of Marlboro discussing State's role in solid waste disposal on May 20, 1970.

On May 28, 1970 Howard Whitmore participated on a panel before representatives of towns of Acton, Ashland, Berlin, Bolton, Boxboro, Harvard, Hopkinton, Hudson, Marlboro, Northboro, Southboro, Stow, Sudbury, Wayland and Westboro.

H. Whitmore met with officials of Lawrence to discuss possible regional approach to Solid Waste Management on June 4, 1970.

Both H. Whitmore and John Gallagher participated in a course on "Elements of Solid Waste Management" in Framingham sponsored by the Federal Department of Health, Education and Welfare.

On June 19, 1970 H. Whitmore met with officials in New Bedford to discuss their present problems and a possible regional approach of solid waste disposal.

H

LEGISLATION

1971 - RECOMMENDATIONS

1. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE REPLACEMENT LAND FOR PUBLIC PARKS, RECREATION AREAS, WILDLIFE PRESERVES AND HISTORIC SITES.

This proposal would authorize the department to acquire replacement land for public parks, recreational areas, wildlife preserves and historic sites whenever such replacement in kind is required by the Federal government as a prerequisite to approval of a federal-aided highway program.

2. AN ACT CLARIFYING THROUGH WAY SIGNING.

The language of the "Through Way Law" presently requires the installation of suitable "warning" signs for the law to become effective. This terminology is incorrect since the signs installed are not "warning" signs but are "regulatory" requiring obedience to the command "stop". This bill strikes out the word "warning".

3. AN ACT RELATIVE TO THE TRANSFER OF LAND ADJACENT TO LIMITED ACCESS HIGHWAYS.

In many instances in the construction of a highway the department acquires land adjacent to the layout which upon completion of the highway is no longer needed for highway purposes. This bill would authorize the department to transfer such unneeded land to another state department upon mutual agreement as to the terms.

LEGISLATION

1971 - RECOMMENDATIONS CONT'D

4. AN ACT PROVIDING FOR DRIVING A VEHICLE DURING INCLEMENT WEATHER CONDITIONS.

At the present time, Massachusetts Laws do not contain sufficient requirements governing the operation of vehicles on our arterial highway system during inclement weather conditions. This bill would provide for the official declaration of a weather emergency period after local request and would require special traction precautions during such period.

5. AN ACT TO PROHIBIT THE USE OF STUDDERED SNOW TIRES ON PUBLIC WAYS BETWEEN MAY FIRST AND NOVEMBER FIRST.

Studies have indicated that during warm weather experienced between May 1st and November 1st studded tires cause excessive wear on highway surfaces. This bill would prohibit use of studded tires during this period.

6. AN ACT RELATIVE TO THE BONDING PROVISION REQUIRED FOR THE EXCAVATION OF PUBLIC WAYS.

The present bonding requirements of not less than five hundred dollars nor more than ten thousand dollars in not sufficient to guarantee satisfactory performance by contractors. The increase to two thousand dollars and twenty-five thousand dollars limits will provide more reasonable surety bonds to protect the public interests in contractual work.

LEGISLATION

1971 - RECOMMENDATIONS CONT'D

7. AN ACT RELATIVE TO COMPENSATION FOR DISPLACEMENT OF TIDEWATER.

This bill provided for revision in the charges to be made for the displacement of tidewater.

8. AN ACT RELATIVE TO CERTAIN STRUCTURES IN GREAT PONDS.

This bill will eliminate the requirement for property owners abutting Great Ponds to obtain a license for insignificant structures.

9. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ESTABLISH SPEED ZONING ON ALL NUMBERED ROUTES.

Since 1948 the department and municipalities have been authorized to establish speed zones on ways under their respective controls. For some time now, breaks in State Highways on numbered routes have been indicated as confusing to vehicle operators and more particularly so where the breaks have been speed zoned by local officials. This authorization for the department to speed zone all numbered routes will not only be helpful to the motorists but will provide for continuity as well as uniformity in controls along out numbered route system.

10. AN ACT AUTHORIZING THE DEPARTMENT TO ACQUIRE LAND FOR THE PARKING OF VEHICLES.

This bill will authorize the department to acquire land and a dead end street (Minot Street) adjacent to the motor pool which is badly needed for the parking of from fifty to sixty vehicles.

LEGISLATION

1971 - RECOMMENDATIONS CONT'D

11. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO PROVIDE ROADSIDE SERVICE FACILITIES.

This bill would clarify the law regarding department activities and participation in providing roadside service facilities and comfort stations for the motoring public.

12. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO EXPEND FUNDS TO MAINTAIN AND RESTORE THE MILESTONE MARKERS ON THE OLD BOSTON POST ROAD.

This bill will provide funds, on a federal matching fund basis, for carrying out the provisions of Chapter 621, Acts of 1960.

13. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO REHABILITATE PROPERTY ACQUIRED IN CONNECTION WITH ACCELERATED HIGHWAY PROGRAM AND TO PAY CHARGES FOR PROPERTY MANAGEMENT FROM INCOME RECEIVED.

The moratorium on highway construction is partly to preserve the housing resources of the areas involved, so in order to preserve, rehabilitate and manage the acquired properties for housing purposes during the period of the moratorium, this proposed bill amends Chapter 427, Acts of 1966.

14. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO MAKE RELOCATION PAYMENTS TO PERSONS WHO HAVE LAWFULLY OCCUPIED ACQUIRED PROPERTY SUBSEQUENT TO ACQUISITION.

This proposal will provide relocation payments for those who move into acquired properties.

LEGISLATION

1971 - RECOMMENDATIONS CONT'D

15. AN ACT REDEFINING DISPLACES OCCUPANT FOR PURPOSES OF RELOCATION ASSISTANCE.

This proposal redefines "displaced occupant" to as to include those who move into acquired property during the period of moratorium.

16. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO MAKE MORTGAGE REPLACEMENT REFINANCING PAYMENTS TO OWNERS OF PROPERTY ACQUIRED BY SAID DEPARTMENT.

This proposal provides a payment to residential owners for the increased mortgage interests costs incurred in purchasing a replacement residence.

17. AN ACT CLARIFYING THE PROVISIONS FOR FEDERAL REIMBURSEMENT OF RELOCATION ASSISTANCE PROGRAMS.

This proposed bill would repeal an amendment to Chapter 79, General Laws, which at present could allow damages to vest before they are ascertained the right to damage to expire before they are fixed, in eminent domain takings by the Commonwealth.

18. AN ACT AUTHORIZING THE TAKING AUTHORITY TO APPLY THE RULE DE MINIMIS IN ORDER TO PREVENT A HARDSHIP ON THE PERSON OR PERSONS IN WHOM THE RIGHT TO DAMAGES HAS VESTED.

This proposed bill would allow the application of administrative discretion in the cases of small land damage payments (under \$500) where such payments are held up due to deficiencies of title and where it is impossible or financially prohibitive to clear up such deficiencies.

LEGISLATION

19. AN ACT PROVIDING FOR UNIFORM PROVISIONS OF LAW CONCERNING PERSONS DISPLACED FROM THEIR HOMES, BUSINESS OR FARMS BY FEDERALLY ASSISTED PROGRAMS.

This proposed bill would provide for uniform relocation assistance in all federally assisted programs and is in anticipation of Federal legislation presently pending in Congress.

20. AN ACT PROVIDING FOR UNIFORM PROVISIONS OF LAW CONCERNING PERSONS DISPLACED FROM THEIR HOMES, BUSINESSES OR FARMS.

This proposed bill would provide for uniform relocation assistance whenever property is taken by eminent domain, whether or not such program is federally assisted.

LAND TAKINGS

21. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (BELLINGHAM)
22. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (PEABODY)
23. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (WALTHAM)
24. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (CHICOPEE-HOLYOKE)
25. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LAND FOR HIGHWAY PURPOSES. (SOUTH HADLEY)
26. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (OXFORD)
27. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (CHESTERFIELD)

LEGISLATION

LAND TAKINGS CONT'D

28. AN ACT AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (BRIMFIELD)
29. AN ACT AUTHORIZING THE TRANSFER OF CERTAIN LANDS OF THE COMMONWEALTH TO THE CONTROL OF THE DEPARTMENT OF PUBLIC WORKS FOR HIGHWAY PURPOSES. (MONTEREY)
30. AN ACT AUTHORIZING THE TRANSFER OF CERTAIN LANDS OF THE COMMONWEALTH TO THE CONTROL OF THE DEPARTMENT OF PUBLIC WORKS FOR HIGHWAY PURPOSES, AUTHORIZING THE TRANSFER OF CERTAIN OTHER SUCH LANDS TO THE CONTROL OF THE DEPARTMENT OF NATURAL RESOURCES FOR FORESTRY, RECREATION AND CONSERVATION PURPOSES, AND AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (ERVING-ORANGE)
31. AN ACT AUTHORIZING THE TRANSFER OF CERTAIN LANDS OF THE COMMONWEALTH TO THE CONTROL OF THE DEPARTMENT OF PUBLIC WORKS FOR HIGHWAY PURPOSES, AND AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LAND FOR HIGHWAY PURPOSES. (PITTSFIELD)
32. AN ACT AUTHORIZING THE TRANSFER OF CERTAIN LANDS OF THE COMMONWEALTH TO THE CONTROL OF THE DEPARTMENT OF PUBLIC WORKS FOR HIGHWAY PURPOSES AND AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (GARDNER)
33. AN ACT AUTHORIZING THE TRANSFER OF CERTAIN LANDS OF THE COMMONWEALTH TO THE CONTROL OF THE DEPARTMENT OF PUBLIC WORKS FOR HIGHWAY PURPOSES AND AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (BOXFORD)
34. AN ACT AUTHORIZING THE TRANSFER OF CERTAIN LANDS OF THE COMMONWEALTH TO THE DEPARTMENT OF PUBLIC WORKS FOR HIGHWAY PURPOSES AND AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (MEDFIELD)
35. AN ACT AUTHORIZING THE TRANSFER OF CERTAIN LANDS OF THE COMMONWEALTH TO THE CONTROL OF THE DEPARTMENT OF PUBLIC WORKS FOR HIGHWAY PURPOSES AND AUTHORIZING THE DEPARTMENT OF PUBLIC WORKS TO ACQUIRE CERTAIN OTHER PUBLIC LANDS FOR HIGHWAY PURPOSES. (FITCBURG-LEOMINSTER)

LEGISLATION

LAND TAKINGS CONT'D

36. AN ACT AUTHORIZING THE TRANSFER OF CERTAIN LANDS OF THE COMMONWEALTH TO THE CONTROL OF THE DEPARTMENT OF PUBLIC WORKS FOR HIGHWAY PURPOSES. (WAREHAM)

The previous sixteen bills authorize the departments taking of other dedicated lands for highway purposes.

37. RESOLVE IN FAVOR OF DONALD C. HAYES

This act would authorize payment to Donald C. Hayes for expenses incurred in the performance of his duties.

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